

AFAC INDEPENDENT OPERATIONAL REVIEW

**A review of the management of the Tasmanian
fires of December 2018 – March 2019**



Prepared for the Tasmanian Government

ACKNOWLEDGEMENTS

This Review was conducted under the auspices of the Australasian Fire and Emergency Service Authorities Council (AFAC) by:

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Overall direction was provided by the AFAC office.

The Review team would like to thank those individuals who gave freely of their time and spoke openly with the Review members. The team benefitted from the input of representatives of the Tasmanian fire agencies, representatives of interstate agencies that assisted with the management of the fires, officials from the Tasmanian State Government and representatives of organisations with an interest in promoting the values of the Tasmanian wilderness areas.

The Review team also greatly appreciates the time taken by members of the public and interested parties to respond to the call for public submissions made in relation to this Review. The Review team read and took account of each submission. We have not attempted to respond in this report to individual submissions made but we have had regard to the major themes that emerged.

The input of all participants in preparing this document was of great benefit to the Review team. However, the content of this report and its conclusions remain the joint responsibility of the team.

AFAC, July 2019

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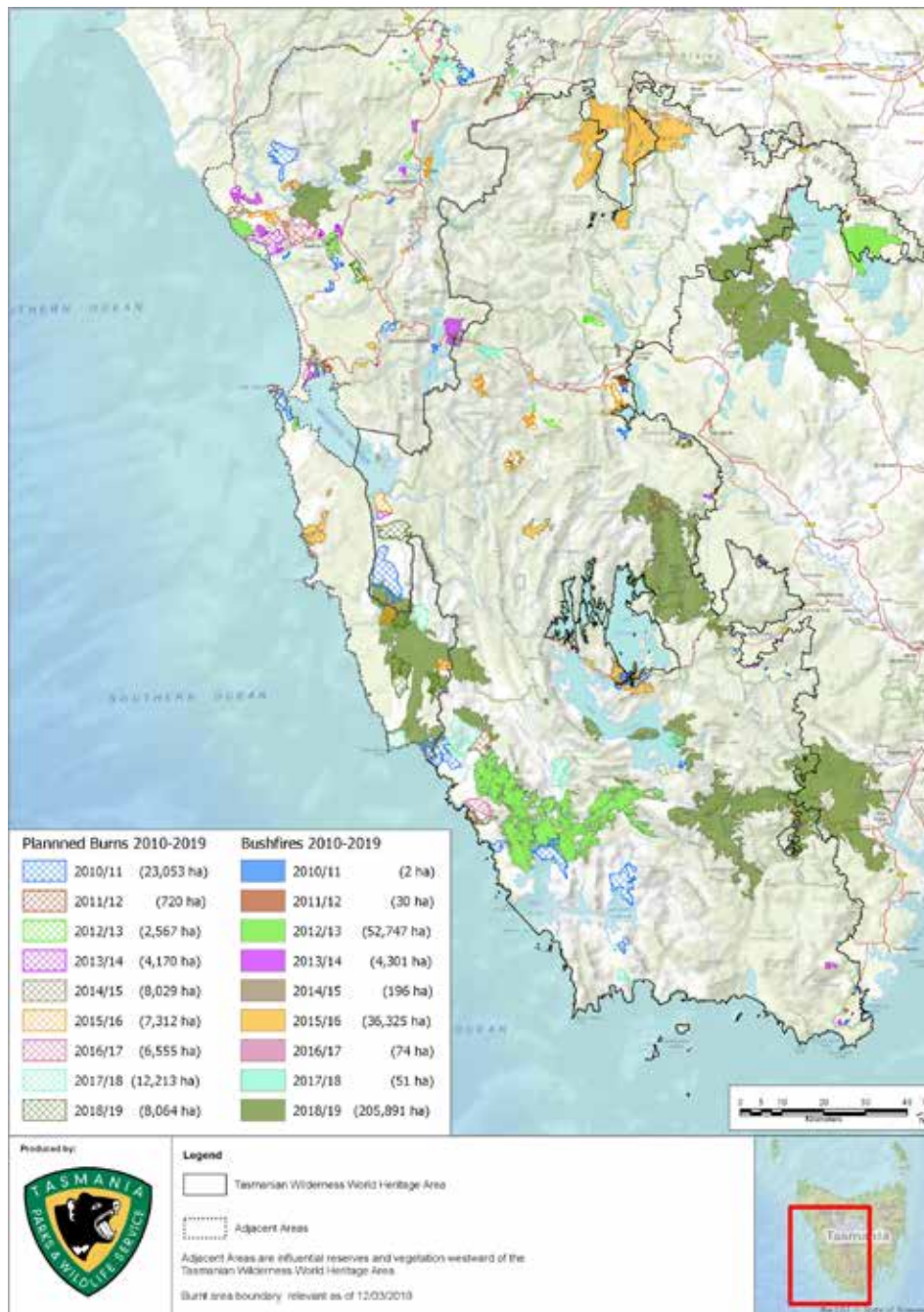


TABLE OF CONTENTS

1 Summary	4
Recommendations	5
2 About the Review	6
Introduction	6
Terms of Reference	6
Relationship to other review activities	7
Methodology	7
3 The causes, chronology and response of the 2018-19 bushfires in Tasmania on and following 28 December 2018	8
Weather	8
Chronology	10
South-west Complex (Cambridge IMT)	10
Rosebery Complex (Rosebery IMT)	12
The Great Pine Tier Fire (Great Pine Tier IMT)	13
Other fires	13
Response: State Operations Centre and Regional Operations Centres	14
Response: Incident Management Teams	14
South West Complex	14
Rosebery Complex	14
Great Pine Tier	14
Response: Resources deployed	15
Air Bases	15
Response: Public Information/Community Forums	16
Evacuation Centres Activated	16
Impacts	16
Built environment	16
Power Networks	16
Road Networks	17
Hydro Power	17
Water Infrastructure	17
Timber and Forestry	17
Apiary Industry	17
Heritage	17
Significant Vegetation	17
Very Tall Forests	17
Myrtle-beech rainforests	17
4 Discussion and conclusions	18
TOR 2: The effectiveness of community messaging and warnings	18
TOR 3: The timeliness and effectiveness of the fire response and management strategy, including accommodating the priorities of life, property, timber production and forest asset values, and environmental and cultural values by Tasmanian fire agencies	20
Firefighting in the rural/urban interface	20
The Tasmanian Wilderness World Heritage Area (TWWHA)	21
TasNetworks	24
Identifying Values	25

Use of retardant	26
Fire management: speed and weight of attack	26
Recommendation 1	27
Recommendation 2	28
Bureau of Meteorology	29
Gell River	29
Riveaux Road	30
Great Pine Tier	31
TOR 4: The impact and effectiveness of fuel management programs in the fire affected areas on the management and containment of the fires	31
Recommendation 3	35
Recommendation 4	35
TOR 5: The effectiveness of state, regional and local command, control and co-ordination arrangements, to include agency interoperability and the co-ordination of emergency management activities with government and non-government organisations	36
State-level management	37
Recommendation 5	39
State, Regional and local level coordination	40
TOR 6: The effectiveness of the arrangements in place for requesting and managing interstate and international assistance and the significance of interstate and international assistance in managing the fires	41
TOR 7: The use and effectiveness of aviation firefighting resources, in particular, the suitability of aircraft types for the protection of environmental values, forest assets and the rural/urban interface in Tasmania	43
Recommendation 6	45
Recommendation 6A	46
Recommendation 7	47
TOR 8: Any other matter that the Review team identifies in the course of its activities as warranting discussion	48
Safety	48
Leave management	49
Finance	49
Recommendation 8	49
Traffic management points	50
Private firefighting resources	50
Facilities	50
ICT and data	51
Follow-up and tracking of recommendations	51
Recommendation 9	51
5 Public Consultation	52
6 Conclusions	54
7 Glossary	55
Annexe A: the Tasmanian fire agencies	56
The Commission, Chief Officer and Tasmanian Fire Service	56
Parks and Wildlife Service	56
Sustainable Timber Tasmania	57
Annexe B: the Review team	58
Annexe C: Organisations that contributed to the Review	59
References	60

1 SUMMARY

- 1.1 On Christmas Eve 2018, a deliberately started fire on Bruny Island burned 122 hectares and required the evacuation of holidaymakers and residents. This incident, significant in itself, heralded the start of the 2018-19 fire season in Tasmania – in terms of hectares burned, the largest since at least 1967.
- 1.2 Subsequent dry lightning strikes ignited fires at Gell River (27 December), Great Pine Tier (15 January) and Riveaux Road (15 January) – to name but three of the many serious and significant fires that burned over 210,000 hectares of Tasmania during the summer.
- 1.3 Meteorological conditions in the lead-up to the season had not been extreme and there was no particular reason leading into summer to expect extensive fire activity. The weather behind the fires becoming as significant as they did is more a story of notably dry and warm conditions in December, January and February which allowed fuels to dry and fires to become established across the State.
- 1.4 The three fire agencies in Tasmania (Tasmania Fire Service, Tasmania Parks and Wildlife Service and Sustainable Timber Tasmania) are experienced in fighting major bushfires, with the most recent severe season being in 2016. They were not taken unaware by the 2018-19 season and were able successfully to apply organisational structures and firefighting tactics that had been refined from past experience.
- 1.5 There are two stories to tell about the impacts of these fires: the significant success of the Tasmanian fire agencies in protecting human life and property, and, as in 2016, the damage done to ecological and wilderness values in the Tasmanian Wilderness World Heritage Area. Lamentable though the damage to natural values was, Tasmanians should see the efforts to preserve human life as a major achievement.
- 1.6 As often occurs in events of this scale, certain accounts of the fires have gained popular currency: that the Gell River fire was not properly managed in its early stages allowing it to escape; that the Great Pine Tier fire could have been stopped in its tracks if firefighters had been allowed to use machinery in the World Heritage Area, and that arguments between agencies meant that the Riveaux Road fire went unchecked.
- 1.7 In the opinion of the Review things are not that straightforward. With the benefit of hindsight the Gell River fire could have been handled differently, but was managed competently according to accepted industry practice; there was no Parks and Wildlife Service ban on using machinery in the TWWHA and the request for a machine on the Great Pine Tier fire never reached them and in any event it is not possible to say with any confidence that it would have made a difference; and any shortcomings in the management of the Riveaux Road fire were not down to interagency rivalry.
- 1.8 There are lessons to be learned from any major fire event and there are lessons to be learned from these fires too: rather than seeking to assign blame, the Review team has tried to outline what those lessons are in this report and to make suggestions about how these lessons could be turned into improvements in practice.
- 1.9 Other significant issues that the Review has looked at are fire legislation and policy in Tasmania – which is acknowledged by all to be overdue for an overhaul; the use of aircraft in firefighting – much as aircraft are a valuable tool in the firefighter's toolbox, they are a very expensive one, and they cannot solve all of the problems that an event of this nature brings; the use of interstate and international resources – while there are reasoned arguments for increasing Tasmanian state firefighting capacity, it will never be large enough to deal with a season like 2018-19 and so assistance from outside the State will always be a consideration; and facilities – the Review concluded that Tasmania would be well-served by a purpose-built State Control Centre for the management of major natural hazards.
- 1.10 Because a Review of this nature aims to identify learning points, the resulting report can often be seen as negative in tone, and it is easy to take parts of the report in isolation in order to bolster particular lines of criticism. The Review team would urge the reader to identify and learn the lessons of the 2018-19 fire season, but not allow that to detract from the hard and unremitting work – with many excellent outcomes – of the volunteers and staff of the Tasmanian fire agencies, and all those Tasmanian, interstate and international organisations and individuals who supported the firefighting effort.

RECOMMENDATIONS

1.11 We make recommendations as follows:

Recommendation 1

TFS, PWS and STT initiate a discussion among their Australasian peers about good practice around managing new fire starts in remote terrain, to include issues around identification, predictive analysis, risk management and suppression activities. The outcome should be a document which allows for benchmarking to accepted good practice across Australasia, from which Tasmanian fire agencies can develop protocols against which the management of future events can be tested.

Recommendation 2

TFS should pursue the creation of a cadre of volunteer remote area firefighters. In doing so the TFS should not consider itself limited to upskilling of current volunteer brigade members, but should carry out a cost benefit analysis of creating one or more remote area firefighting units based in urban areas, in order to tap into the potential of those members of the urban-based Tasmanian community who may have advanced knowledge and skills relating to navigation and survival in wilderness areas.

Recommendation 3

TFS should initiate a policy review (seeking support from government as appropriate) to clearly identify what body or agency is responsible for planning, carrying out and enforcing fuel management on private property at a township level. If current arrangements are unclear or ineffective, TFS should request government to consider making this a statutory responsibility of TFS and provide any additional funding required to support this function.

Recommendation 4

TFS, PWS and STT should work with government and each other to continue to pursue a whole-of-state fuel management and burning program that encompasses all land tenures, meets the range of outcomes required by the state (township protection, risk reduction and landscape-scale burns) and is inclusive of private landholders and local communities as well as all fire agencies.

Recommendation 5

TFS, PWS and STT agree an updated version of the Interagency Fire Management Protocol which maintains the principle that there will be one state-wide point of command for major unwanted fires burning in the State of Tasmania, explicitly recognises the right of each of TFS, PWS and STT to have their objectives prioritised in incident action planning and adequate resources applied to those objectives, and provides a mechanism for executive decision-makers from TFS, PWS and STT to come together and agree objectives and resourcing levels that will then be operationalised by whole-of-State control structures.

Recommendation 6

TFS, PWS and STT should establish a State Air Desk, to be staffed by specialist staff year-round, with responsibility for managing both preparatory and contractual issues out of season as well as aircraft management when fires or other emergency events are occurring.

Recommendation 6A

The proposed Tasmania State Air Desk should have a finance officer attached to its staff.

Recommendation 7

TFS, PWS and STT should jointly reach a decision on whether a winch capable remote area firefighting capability should be maintained in Tasmania; which agency or agencies should be responsible for that program; and how a winch capable remote area firefighting capability can be safely trained and kept current, to include consideration of the availability of winching aircraft. If the decision is taken not to maintain this capability in the state, TFS, PWS and STT should identify how the gap in capability that this represents should be filled in future fire seasons.

Recommendation 8

TFS, PWS and STT should jointly carry out work to identify acceptable shift lengths and patterns – including requirements for rest days – for all personnel working on emergency operations. Once these have been identified, systems should be put in place to ensure that HR rostering practices follow these fatigue management guidelines. And senior staff should lead by example and ensure that they, as well as the people working under them, take adequate rest breaks.

Recommendation 9

TFS should engage in discussions with government about the construction of purpose-built State Control Centre facilities for emergency management in Tasmania.

2 ABOUT THE REVIEW

INTRODUCTION

- 2.1 This Review was requested by the Tasmanian Government into the management of the 2018-19 bushfires by the Tasmanian fire agencies, namely Tasmania Fire Service (TFS), Tasmania Parks and Wildlife Service (PWS) and Sustainable Timber Tasmania (STT). It has been conducted on a non-statutory basis, with no formal powers of compulsion of witnesses or documents.
- 2.2 Tasmania has a history of proactively seeking external Reviews of significant fire seasons, and these have taken place previously in 2013 and 2016. This is a demonstration of a culture of seeking to learn from major events, and we hope that this Review supports that.
- 2.3 The Australasian Fire and Emergency Service Authorities Council (AFAC) identified a team of three people from across the sector to carry out the Review. Deputy Commissioner Mal Cronstedt from the Department of Fire and Emergency Services WA chaired the team, which also included Guy Thomas from Queensland Parks and Wildlife Service and Paul Considine from AFAC.
- 2.4 The Review team has broad and varied experience of urban fire, rural fire, land management and aviation operations from both Australia and overseas. The AFAC office supported the Review and acted as a sounding board for our conclusions and recommendations. The Review has had regard to other publications¹ in compiling this report. The result is intended as an independent review, at a strategic level, of operations in the 2018-19 fire season in Tasmania.
- 2.5 The Review team and AFAC do not have responsibility for tracking the uptake and implementation of the findings of this Review – our work is over once the report has been delivered to the Tasmanian Government. We understand the challenge to emergency management agencies (in particular) when repeated incidents lead to repeated reviews and an ever-increasing list of recommendations to be addressed – not all of which may be practical to achieve within budget and policy constraints. We include a brief reflection on this at the end of this report.

TERMS OF REFERENCE

- 2.6 The terms of reference for this Review were agreed between AFAC and the Tasmanian Government and are as follows:
- The causes, chronology and response of the 2018-19 bushfires in Tasmania on and following 28 December 2018.
 - The effectiveness of community messaging and warnings.
 - The timeliness and effectiveness of the fire response and management strategy, including accommodating the priorities of life, property, timber production and forest asset values, and environmental and cultural values by Tasmanian fire agencies.
 - The impact and effectiveness of fuel management programs in the fire affected areas on the management and containment of the fires.
 - The effectiveness of state, regional and local command, control and co-ordination arrangements, to include agency interoperability and the co-ordination of emergency management activities with government and non-government organisations.
 - The effectiveness of the arrangements in place for requesting and managing interstate and international assistance and the significance of interstate and international assistance in managing the fires.
 - The use and effectiveness of aviation firefighting resources, in particular, the suitability of aircraft types for the protection of environmental values, forest assets and the rural/urban interface in Tasmania.
 - Any other matter that the Review identifies in the course of its activities as warranting discussion.
 - The Review will provide a means for members of the public and other interested parties to make submissions to the Review and will have regard to any submissions received in compiling its report.

¹ AFAC *Conducting Independent Operational Audits*, Version 2, AFAC, 2018; *What is Operational Success for Fire and Emergency Services*, AFAC, January 2015; *Strategic Directions for Fire and Emergency Services in Australia and New Zealand 2017-2021*, AFAC, 2016.

RELATIONSHIP TO OTHER REVIEW ACTIVITIES

- 2.7 We were advised that other after-action reviews are also being undertaken independently by the agencies involved. They include debriefing and after-action review exercises being undertaken internally within Tasmanian fire agencies, Tasmania Police and supporting organisations in other jurisdictions. These internal exercises will not necessarily be designed to be put into the public domain and may be expected to focus on the operational aspects of the event.
- 2.8 This report is free-standing and based on the evidence that the Review gathered during its fieldwork phase. It deliberately does not deal with the detailed operational issues that will have been addressed in internal after-action reviews, and our intent has been to maintain the discussion and conclusions of this report at a more strategic level.

METHODOLOGY

- 2.9 The Review team travelled to Tasmania in March and April 2019 and met with Tasmanian fire agency staff, personnel from other agencies, government and representative bodies. The Review had the opportunity to visit a number of the firegrounds and discuss the strategies used there. We considered documentation relevant to State emergency management arrangements, preparedness, response and recovery. We also contacted some stakeholders by email and telephone to obtain feedback on their experience of the management of the fires.
- 2.10 A call for public submissions to the Review was published in the Tasmanian press on 6 April 2019 and further distributed through social media. We received 80 submissions, which the Review team has read and had regard to. The number and detailed content of many of these submissions means that we cannot respond to each point that was made to us. We have however carefully considered what has been said to us, and we hope we have been able to identify all of the major themes. In addition, the submissions made will be published (unless the author asked us not to) and so form a record of the issues that were subject to public debate following these events.
- 2.11 The Review has adopted the following principles:
- We have not tried to read and digest every document produced in relation to the management of the fires. We have been provided with a significant amount of documentation by participating agencies and we have reviewed key documents that have assisted our understanding of the circumstances of the fires.
 - We have not acted as a fact-finding body to resolve disputes. Where we have identified issues with the management of the fires we have discussed these with the people involved and we have reached conclusions based on the available evidence and our professional judgment. We have not gone about this exercise in the same way as a court or legal inquiry would, and our conclusions should not be relied upon to apportion blame or prove that one party or another is right about a particular issue.
- 2.12 We may use language in this report such as 'we were told', which sets the context for the conclusions that follow, but does not imply that we investigated and confirmed the truth of the statement. If we use phrases such as 'we found' or 'we conclude' these should be taken as conveying our opinion on the matter based on the best evidence available to us.
- 2.13 Arising out of the Review we have identified certain recommendations for the Tasmanian fire agencies: we invite them to have regard to our recommendations while acknowledging that it is a matter for the agencies to prioritise these as they see fit. In places in this report, we have made a number of comments that we have not wished to elevate to the status of recommendations, but which, again, we invite the agencies to take account of in their future business planning.

3 THE CAUSES, CHRONOLOGY AND RESPONSE OF THE 2018-19 BUSHFIRES IN TASMANIA ON AND FOLLOWING 28 DECEMBER 2018

WEATHER

- 3.1 Records of the antecedent weather conditions to the 2018-19 Tasmanian bushfire events showed the State had experienced a warm, but somewhat average year overall. Mean temperature was 0.71 °C above average across Tasmania in 2018, making it the fifth-warmest year since 1910. Rainfall for the year was close to average but significant variations across the months. Although there were concerns about bushfire risk in east coast areas, up until December there was little to indicate a particularly bad fire season ahead for the State.
- 3.2 The summer of 2018-19 was Tasmania's second-warmest on record, with the mean temperature 1.60 °C above average; and only slightly cooler than the record summer of 2015-16. A feature of the summer was persistently warm days, especially during December and January and few especially cool days.
- 3.3 Most areas had little if any rain for about six weeks from late December to early February. In particular January had about one-fifth of its average rainfall and was Tasmania's second-driest on record (after January 1939). Parts of the southeast had their driest summer on record. Most of the east and north of Tasmania had less than 10 mm of rain for the whole month, and even in the usually wet western highlands totals were less than 100 mm.
- 3.4 These very dry and consistently warm conditions resulted in extreme dryness and rapid curing in most vegetation types including wet forests and moorlands. Vegetation that would ordinarily be too moist to burn became available fuel.
- 3.5 Extensive bands of lightning extended across the western and southwestern areas of the State on 14 and 15 January, with the second event producing over 2400 dry lightning strikes. The absence of any associated rainfall and hot, dry conditions resulted in over 70 new fires breaking out across the State. Several of these became significant fires.

Figure 1:

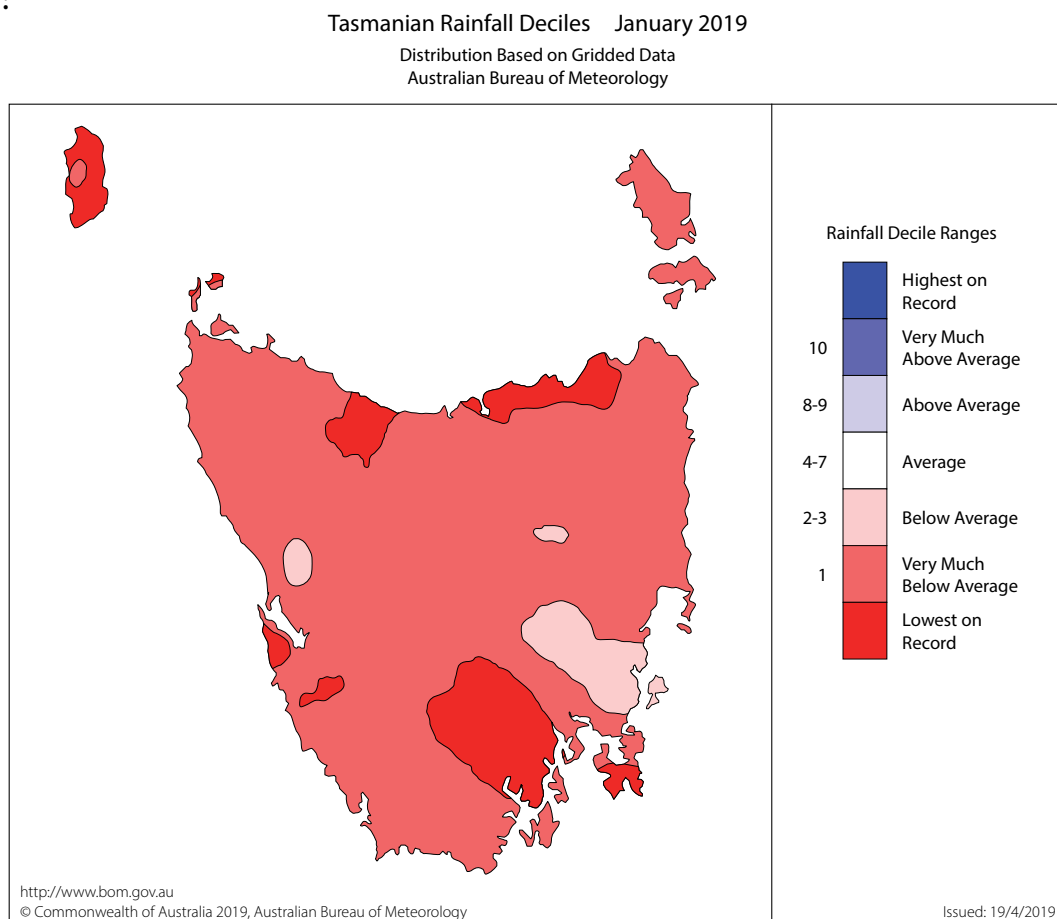


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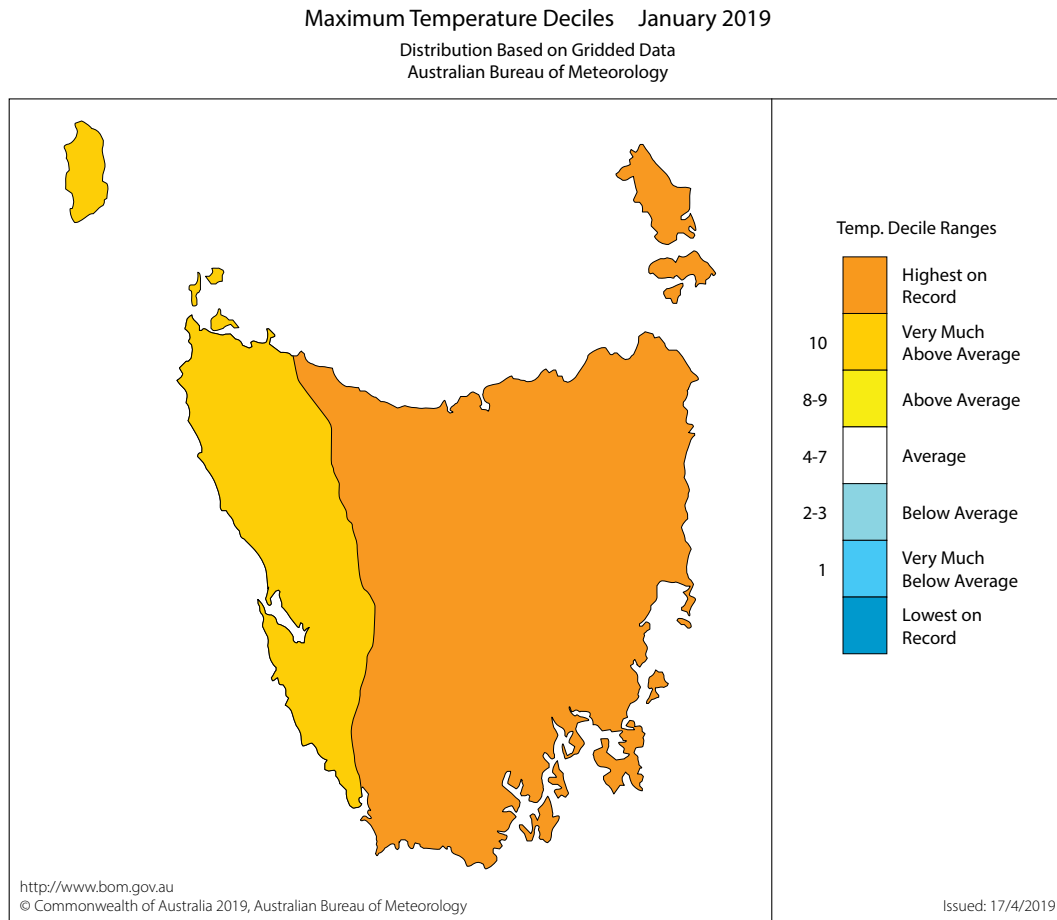
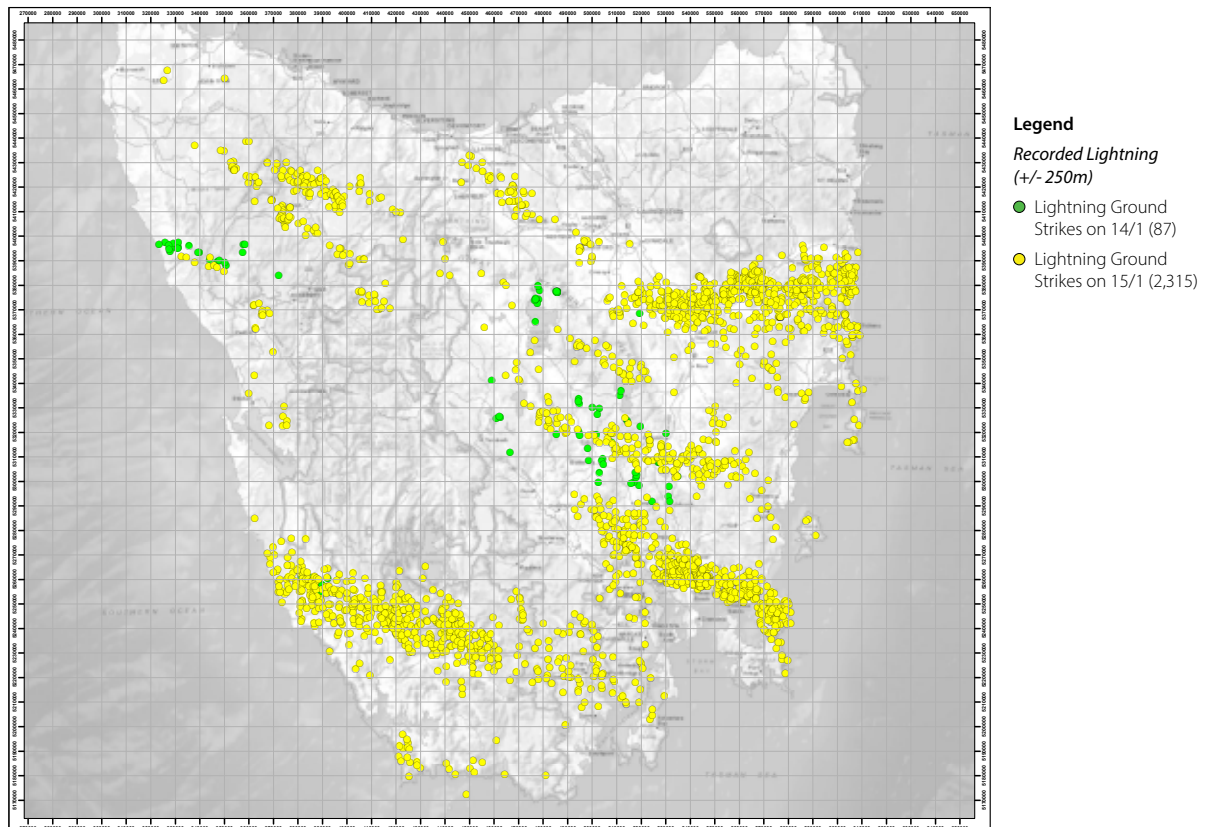


Figure 3: Lightning strikes in Tasmania, 14-15 January 2019



- 3.6 The Review received a number of submissions that suggested dry lightning is becoming increasingly evident in Tasmania. While changing climate is undoubtedly resulting in altered weather conditions and may be influencing patterns of lightning, we heard there are other significant factors that may also be involved. Of particular note is the technological advancement which has significantly enhanced lightning strike tracking capability over the past decade. Simply put, the Bureau of Meteorology has developed enhanced capabilities to better detect lightning, so it is difficult to establish conclusive trends from simple analysis of historical data. What may be evident is that a combination of soil dryness and fuel curing in historically 'wet' vegetation communities is facilitating increased ignitions from lightning strikes than may previously have occurred.
- 3.7 Consistent with fire events in Tasmania and other jurisdictions over the past decade or more we heard reports of firefighters witnessing unusual and unpredictable fire conditions they had not previously experienced. This included fires carrying through very tall 'wet' *Eucalyptus regnans* forest and burning through rainforest ecotone vegetation communities that would ordinarily provide natural control lines.
- 3.8 Consistent with strong scientific evidence and following the significant fire events in Tasmania in 2013, 2016 and 2019 there is broad acknowledgement and acceptance that projected changes to climatic conditions will result in longer, more severe fire seasons for the State, as with other parts of the country. This will only become more challenging as the weather windows open for prescribed burning shift with changing climatic patterns, adding uncertainty and complexity to burn planning.

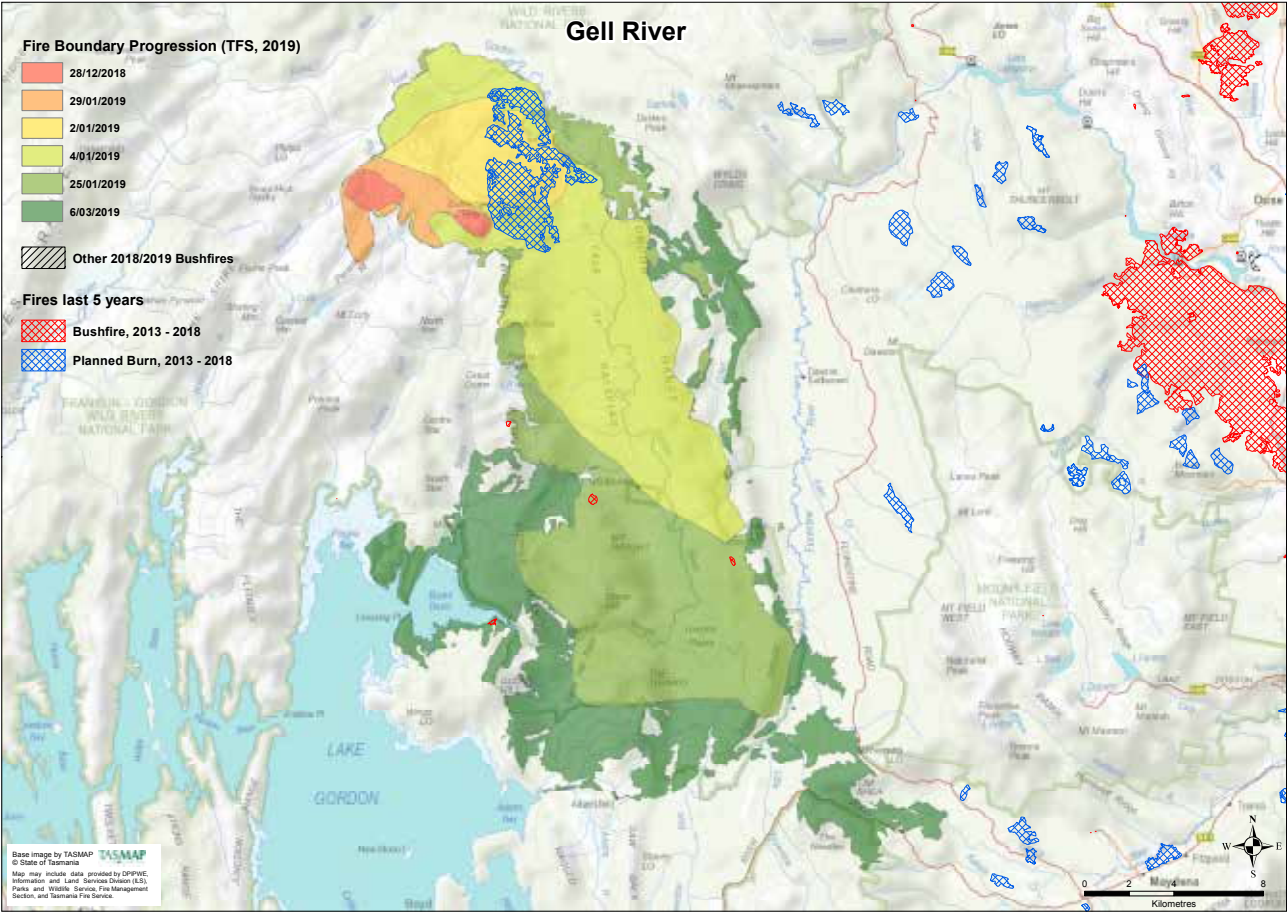
CHRONOLOGY

- 3.9 A deliberately lit fire was detected at Conleys Point on South Bruny Island on 24 December 2018. An Emergency Alert was issued for this fire with the relocation of multiple residents and campers during the late evening and early morning of Christmas Day. Several structures were destroyed or damaged by the fire.
- 3.10 Dry lightning occurred in Tasmania on 27 December 2018. This event ignited fires that went on to merge and become the Gell River fire, 40 kilometres to the northwest of Maydena in the Franklin-Gordon Wild Rivers National Park.
- 3.11 On 15 January 2019, a second lightning event produced 2402 recorded dry lightning strikes across the state, igniting a large number of additional fires. Over 70 fires were started state-wide. A combination of dry conditions, strong winds and inaccessible terrain prevented many of these fires from being controlled. For management purposes the fires were grouped into complexes as follows:
- South-west Complex (managed by an incident management team located at Cambridge, near Hobart)
 - Gell River Fire
 - Riveaux Rd fire
 - Celtic Hill fire
 - Rosebery Complex (incident management team situated at Burnie)
 - Lynch Hill Fire
 - Western Hills Fire
 - Fowl Creek
 - Brittons Link
 - Rapid River
 - The Great Pine Tier Fire (incident management team situated at Youngtown in Launceston)
- 3.12 Another fire (Moore's Valley) in the remote SW burned 36,273 ha with a perimeter of 287 km. Due to the inaccessibility of this area and the lack of significant values at risk, other fires were prioritised, and no active fire suppression was employed. It was monitored by the North West Regional Operations Centre in Burnie.

South-west Complex (Cambridge IMT)

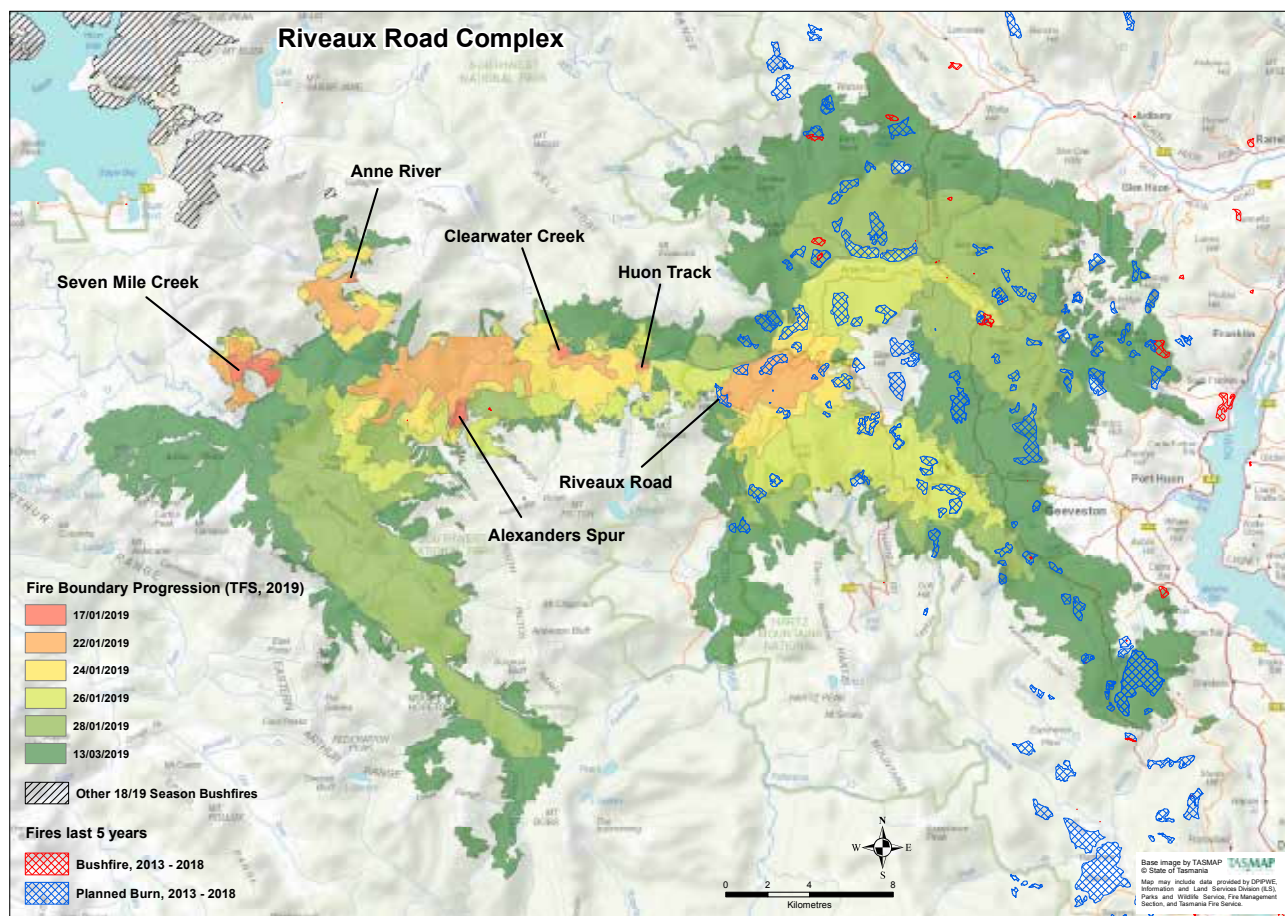
- 3.13 The first fire in this area was the Gell River fire noted above. It was detected on 28 December and burned in the Tasmanian Wilderness World Heritage Area and in commercial timber reserves in the Florentine Valley of significant value to the timber industry. There were a number of fire-sensitive values present in the area, including the Alpine Plateau above Lake Rhona and areas of mixed forest and temperate rainforest. Heritage cultural sites and commercial values as well as key telecommunication infrastructure and power transmission were at risk. The Gell River Fire covered 35,062 ha with a perimeter of 607 km.

Figure 4: Gell River fire progression map



Buttongrass plain in recovery, Gell River, February 2019 (credit: Guy Thomas)

Figure 5: Riveaux Road fire progression map

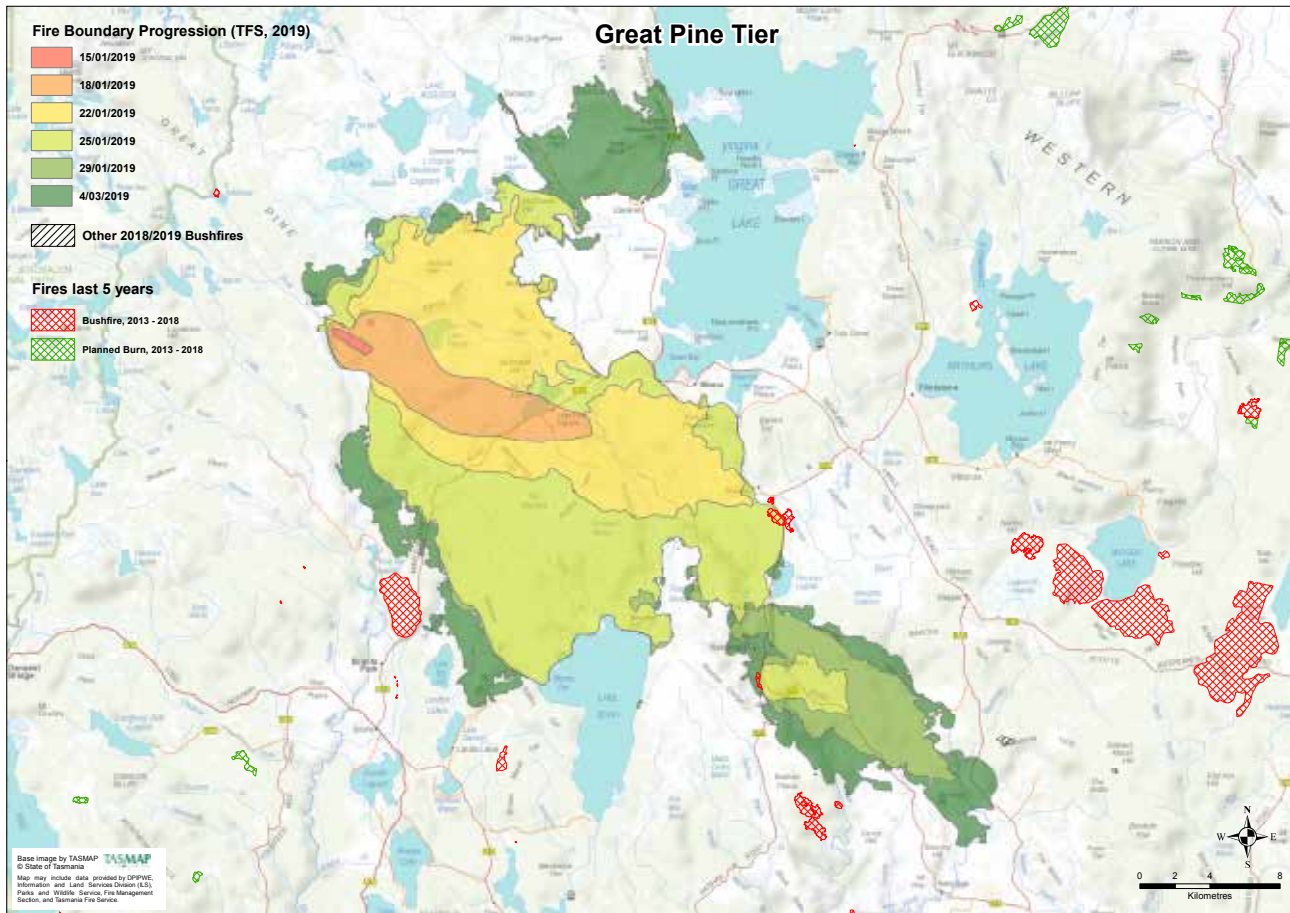


3.14 The Riveaux Rd fire started on 15 January and burned to the west of Huonville and Geeveston on private land and in the South West and Hartz National Parks. There were a number of fires that joined and progressed east of the Kermadie Divide and through Scotts Divide. On 30 January 2019 the fire ran into settled areas of Castle Forbes Bay and parts of Port Huon. Two properties were lost in Frypan Road and one in Bermuda Road, Glen Huon, one in Sheoak Road, Judbury and one on the Huon Highway, Waterloo. The fire covered 63,769 ha with a perimeter of 932 km. The South West complex also included the Celtic Hill (3,560 ha and 99 km fire edge), Mount Solitary (1370 ha and 38 km), Anne Gorge (1009 ha and 21.5 km), and the Lake Pedder fires (1114 ha and 31.2 km).

Rosebery Complex (Rosebery IMT)

- 3.15** The Lynch Hill (2815 ha and 42.8 km) and Western Hills (6492 ha and 55.1 km) fires in the north west of the state were located to the north of Zeehan and the north west of Rosebery. The Lynch Hill fire was identified on 15 January 2019 with limited suppression activity initially due to resource limitations. Ground reconnaissance was undertaken on 19 January 2019 and direct attack commenced by ground crews and light tankers. The Western Hills fire was identified on 16 January 2019. Some aerial suppression was undertaken on 18 January 2019 together with machinery suppression. These fires burned in Regional Reserves and in potential production forest and the Western Hills fire also burned a large area of private land.
- 3.16** The Brittons Link fire 14 km south east of Smithton was largely within a timber production area. The fire was started by machinery operating in a STT harvesting operation area and was first reported on 29 January 2019. This fire covered 2,460 ha with a perimeter of 35 km.
- 3.17** The Rapid River fire was on the North West coast to the east of Dempster Plains. It started on 31 January 2019 and burned in mostly inaccessible and remote areas. Remote Area Firefighting Teams tried on several occasions to gain access but the conditions were not favourable for active firefighting operations. This fire was 477 ha in size with a perimeter of 16 kilometres.

Figure 6: fire progression map, Great Pine Tier



The Great Pine Tier Fire (Great Pine Tier IMT)

- 3.18** The Great Pine Tier fire evolved from a series of smaller fires that started on 15 January 2019, in particular fires at Little Pine Lagoon and Little Pine River. The Great Pine Tier fire burned on the Central Plateau across a combination of public and private conservation estates and other private land. The fire progressed through forestry coupes across the Little Pine River west of Little Pine Lagoon dam, jumped the Marlborough Highway on 18 January and spread east to shacks at Little Pine Lagoon.
- 3.19** Fire behaviour increased due to unpredicted fresh northerly winds on the afternoon of 20 January. This fire threatened the Miena Community (although ultimately did not impact it), and destroyed the nearby Skittleball Plains Homestead. The fire passed through Waddamana on Wednesday 30 January. Under elevated fire danger conditions experienced on 3 February 2019 fire activity at Lake Augusta Road (Liawenee) increased which lead to a significant outbreak and resulted in the fire impacting on the township of Reynolds Neck. This fire covered 51,224 ha with a perimeter of 692 km.

Other fires

- 3.20** A number of additional fires were managed by the TFS Regions and are estimated to have burnt more than 4,000 ha. The most significant of these fires were those located at Sawpit Hill Rd, Gum Flat Rd and Jimmy's Hill.
- 3.21** The total area burned in the 2018-19 fire season in Tasmania was 210,311 ha with a perimeter of 1,854 km. This makes the 2018-19 season the largest since at least 1967 for hectares burned in the State.

RESPONSE: STATE OPERATIONS CENTRE AND REGIONAL OPERATIONS CENTRES

- 3.22 The Regional and State management structures for fire are described in more detail in Part 4 of this report: the narrative below identifies when components of this structure were active ('stood up').
- The State Operations Centre was stood up on 3 and 4 January 2019 and again on 11 January and 16 January until 15 February 2019. It was again stood up 1-2 March 2019.
 - The Southern Regional Operations Centre stood up on 3 and 4 January 2019 and operated until late March supporting interstate resources operating in the Region.
 - The Northern Regional Operations Centre stood up on 3 and 4 January and again on 12 January 2019. It stood down operationally on 12 February 2019; however, it continued in a support role to the Incident Management Team until the handover of the Great Pine Tier Fire to the Southern Region on 18 February 2019. The Northern ROC subsequently stood up in line with doctrine due to predicted weather conditions on 1-2 March 2019.
 - The North West Regional Operations Centre stood up on 18 January 2019. It was on standby prior to this time. The North West ROC was formally stood down on 2 March 2019; however, it was not stood up continually during the latter part of this period but operated in a similar way to the Northern ROC.

RESPONSE: INCIDENT MANAGEMENT TEAMS

- 3.23 The way in which incident management teams (IMTs) are activated to manage fires under the Tasmanian Interagency Protocol for managing fires is described in more detail in Part 4 of this report. Where a Level 3 IMT is referred to below, this means a multi-agency level 3 IMT with a TFS incident controller.

South West Complex

Gell River

- 3.24 A Level 2² PWS IMT was stood up on 29 December 2018 at Strathgordon to manage the Gell River Fire. The Gell River Level 3³ IMT stood up at Cambridge at 0900 hours on Friday 4 January 2019. During 4-5 January the PWS IMT transitioned into the Level 3 IMT at Cambridge, which took the lead on the Gell River fire on 6 January. It remained in place until 16 January 2019 when it was expanded to manage the South West complex of fires. The last day of the Level 3 IMT at Cambridge was 23 March 2019. It was replaced by a Level 2 IMT which operated from PWS facilities and staffed by a majority of PWS personnel.

Riveaux Road

- 3.25 In the early stages, the Riveaux Road fire was burning in wet forest on the northern extent of the Picton River Conservation Area. Classified as 'Conservation Area', the interagency protocol provides for PWS to take lead in a Gazetted reserve. Directly adjacent to the Picton River Conservation Area, and within metres of the fire was a large tract of Permanent Timber Production Zone Land, which is regulated under the *Forest Management Act 2013*.
- 3.26 PWS was initially the control agency with PWS and STT personnel operating on the ground. The management of the Riveaux Road fire was handed over to the Cambridge IMT on the afternoon of 21 January 2019.

Rosebery Complex

- 3.27 The Rosebery Level 3 IMT was stood up on 16 January 2019. It stood down on 24 February 2019.

Great Pine Tier

- 3.28 The Great Pine Tier Level 3 IMT was stood up on 15 January 2019. The IMT was stood down following the handover of the fire to the South West Complex IMT on 18 February 2019.

2 Level 2 IMTs manage more complex fires requiring the deployment of resources beyond initial response, using a core team of incident management personnel.

3 Level 3 IMTs manage highly complex fires requiring a substantial team of incident management personnel to be assembled.



Credit: Warren Frey

RESPONSE: RESOURCES DEPLOYED

- 3.29** Approximately 2,000 employees and volunteers from TFS and the State Emergency Service (SES), 248 PWS, 116 STT personnel and 127 STT firefighting contractors/machinery operators were deployed during the 2018-19 firefighting campaign. Most of these personnel undertook multiple rotations, meaning there were thousands of deployment rotations by Tasmanians.
- 3.30** The Tasmanian Interoperability Register was activated with the Department of Premier and Cabinet on 17 January 2019 for generalist support staff from other Government departments to the State Operations Centre and Incident Management Teams. This made available many public servants to provide operational support.
- 3.31** An Interstate and International Liaison Unit (IILU) was established in Tasmania from 10 January 2019 to coordinate ongoing resource requests and interstate deployments to Tasmania. There were approximately 1,144 interstate and international personnel rotations involving personnel from Victoria (23), New South Wales/Australian Capital Territory (765), Queensland (77), South Australia (93), Western Australia (94), New Zealand (81) and Emergency Management Australia and AFAC (11).
- 3.32** This was supported by a base camp deployed from New South Wales to assist the management of the Gell River fire, being positioned close to the fireground to ensure quick and efficient fireground rotations. The base camp was operational at Fenton Forest from Monday 14 January 2019. The base camp was initially established for 80 personnel but it was expanded for a capacity of an extra 50 personnel on 18 January 2019.

Air Bases

- 3.33** The following airbases were established:
- Friendly Beaches 4 January 2019
 - Valley Field 4 January 2019
 - Port Arthur 4 January 2019
 - Strathgordon 4 January 2019
 - Bushy Park (Gell River) 11 January 2019
 - Cambridge 11 January 2019
 - Rosebery Sports Ground (SW Complex) 18 January 2019

There were also four aviation management units/centres in operation throughout the State. Several other sites supported areas of operation but were not sustained as fully equipped airbases.

RESPONSE: PUBLIC INFORMATION/COMMUNITY FORUMS

- 3.34 Throughout the bushfire campaign, there were a significant number of community warnings issued to impacted communities. There were a total of 41 community forums held along with the insertion of Community Liaison Officers into evacuation centres to provide contemporary information to those impacted by the bushfires. TFS provided a spokesperson on ABC local radio to give additional context to the community information being provided. Daily media briefings were held during the height of the fire activity at 1500 hours to provide bushfire information to the whole community.

Evacuation Centres Activated

- 3.35 During the period 24 December 2018 to February 2019, a number of evacuation centres were opened and closed state-wide in accordance with existing municipal and regional emergency management arrangements. The Bruny Island evacuation centre remained open throughout Christmas Day and approximately 55 campers and local residents were assisted as fire authorities responded to the fire threat.
- 3.36 On 4 January 2019, with the potential for the Gell River fire to impact Maydena and surrounding areas, a 'community comfort' facility was opened at the Salvation Army centre in New Norfolk for residents who chose to leave the area due to smoke and other concerns. The evacuation centre in New Norfolk was prepared to open immediately had the situation escalated.
- 3.37 A cell was established in the Southern Regional Emergency Coordination Centre to develop (operational) evacuation plans for communities threatened by fire. A total of 27 evacuation plans were eventually prepared, primarily relating to areas impacted by the Riveaux Road and Great Pine Tier fires, including a maritime supply and evacuation plan in relation to areas south of Huonville to Dover.
- 3.38 Evacuation centres established at Bothwell, Hamilton and Miena remained open during the height of the bushfire emergency in the Central Plateau. The Central Highlands Council and support services staffed the evacuation centres overnight and, after presentations decreased, during each day (with contact details left at the centres overnight if assistance was required).
- 3.39 The Huon Valley evacuation centre (Huonville PCYC) opened as a community service on 22 January 2019 as there were a small number of people around the facility during the morning. This supported the evacuation of Geeveston and surrounding areas on 28 January. Kingborough Council activated its evacuation centre at the Kingborough Sports Centre on the morning of 31 January 2019. There were no presentations at Kingborough and the centre was closed on 1 February 2019. It remained on standby to open as an evacuation centre if the Huonville evacuation centre reached a pre-determined maximum number of attendees.
- 3.40 Approximately 1,400 people (Tasmanian residents and visitors) presented to evacuation centres throughout the State during the period December 2018 to February 2019.

IMPACTS⁴

Built environment

- 3.41 Rapid Impact Assessment Teams were deployed by the State Operations Centre on 2 February 2019 to verify impacts reported by the IMTs through Situation and Impact Assessment Reports. 6 houses were confirmed destroyed, along with an unconfirmed number of impacts to historic structures, machinery, power poles, sheds and road infrastructure.

Power Networks

- 3.42 TasNetworks assets within the burnt areas suffered some impacts. The Tim Shea Communications Tower was isolated and operated on generator power while the power line to this area was repaired. The Huon River Spur line was extensively damaged. Restoration of the Huon River Spur took place over two to three months to secure power supply to the South Wood mill area. In the Waddamana area (Great Pine Tier fire), precautionary aerial assessment of the lines took place the week of 13 of February 2019 but no damage to the tower lines was identified.

4 This information was current at 13 February 2019 when responsibility was formally transferred to the Recovery Unit run out of the Department of Premier and Cabinet.

Road Networks

- 3.43** 1,358 km of roads and vehicle tracks were within the burnt area with infrastructure such as signage, road barriers and bridges impacted.

Hydro Power

- 3.44** Hydro power infrastructure was only minimally impacted, restricted to two automated water monitoring sites, one rain gauge and one flow monitoring site. It is not expected that the fires will cause any long-term impacts to Hydro Tasmania.

Water Infrastructure

- 3.45** Several water catchments were impacted by the fires with the Huon River Catchment extensively burnt. Rainfall in this catchment will increase water turbidity and pH due to ash runoff. Work was required at the Glen Huon Water Treatment Plant to maintain drinking water quality.

Timber and Forestry

- 3.46** 39,398 ha of land managed by STT was impacted by bushfires over the 2018-19 fire season. A formal assessment is yet to be completed to determine the extent of damage in hardwood plantation, native forest, and regenerating native forest but salvage harvesting, scarifying and reforestation activities will be required. Approximately 32,901 hectares of private forest was also affected.
- 3.47** Roads, tracks and firebreaks are likely to require rehabilitation and impacts to road signage and guide posts are anticipated. The Weld River Bridge has been damaged and will require re-construction which will be a major capital expense. Other damage included the Carbon Flux Tower Warra research area, the Tahune Air Walk and the Southwood timber mill with sheds, an excavator and some product lost.

Apiary Industry

- 3.48** A number of apiary lease sites have been affected in the NW and SW of the state, specifically in the Gordon River Rd area (Gell River fire), the Arve area (Riveaux Road fire) and the Boco Rd/Pieman Rd area (Lynch Hill Fire). Some of these areas are inaccessible to the public and therefore no comprehensive assessment has been made to determine the number of the sites and hives burnt. It is likely to take approximately four years for bee keepers who have lost hives and bees to recover their bee colonies to similar levels.

Heritage

- 3.49** Some Aboriginal Heritage sites are known to have been affected by the fire. Further investigations will be required to determine the degree to which they have been impacted. Access may need to be restricted to these areas to prevent further impacts if the fire has made them visible to the public. The post-fire period can also provide a significant opportunity to undertake surveys for Aboriginal Heritage sites in areas that are otherwise inaccessible.
- 3.50** The Parks and Wildlife Service has confirmed that a building reputed to be Churchill's Hut, a significant heritage structure, has been lost.

Significant Vegetation

- 3.51** Significant areas of alpine heath, sedgeland and grassland occur within the boundaries of the fires, although at this stage it is unknown how much of this has actually been burnt. Most of this potentially impacted vegetation is within the Lake Fergus and Gell River fire areas. The 'Arve Big Tree' has been confirmed as destroyed. To date, visual assessment of the Centurion tree in the Riveaux Rd fire suggests this tree has not been significantly impacted.

Very Tall Forests

- 3.52** Forests more than 70 metres in height are globally rare. Tasmania has approximately 6318 ha of very tall eucalypt forest over 70 m in height. Approximately 14 per cent of Tasmania's very tall forests were burned: 296 ha by the Gell River fire, which includes parts of the largest patches of very tall eucalypt forest within the Coles Creek area on the Gordon Range, and another 607 ha by the Riveaux Road fire.

Myrtle-beech rainforests

- 3.53** Mapping of myrtle-beech dominated rainforests shows 7000 ha within the perimeter of the fires, with the largest areas being within the Moores Valley/Dolphin Ridge (2900 ha), Riveaux Road (2500 ha) and Lynch Hill/Western Hills (1400 ha) fires.

4 DISCUSSION AND CONCLUSIONS

- 4.0.1 In this section of our report, we address in turn the terms of reference that the Review worked to.
- 4.0.2 Few reviews of fire and emergency incidents working with the benefit of hindsight could not identify learning points for the future and this is one of the main reasons why reviews of this nature are commissioned. Our comments and recommendations should therefore be read in the spirit that they are intended, to support continuous improvement of the delivery of fire and emergency services both in Tasmania and beyond.

4.1 TOR 2: The effectiveness of community messaging and warnings

- 4.1.1 There is a broad recognition across the Australasian emergency management community that information and warnings are a key part of managing any emergency. It was apparent to the Review team that Tasmanian fire and emergency services have embedded this principle in their operations, and the dissemination of warnings is the first priority for firefighters when bushfires are burning out of control.
- 4.1.2 The feedback we received about community messaging and warnings for the 2018-19 fire season was generally very positive. A large amount of information about the fires, their progress, and impacts such as road closures was made available through broadcast media and via the Tasmania Fire Service and Parks and Wildlife Service websites.
- 4.1.3 The Parks and Wildlife Service faces particular challenges in reaching people who are undertaking recreational activities in rural and wilderness areas. This was identified as an issue that Parks managed successfully in the 2016 fires, and we found that the efforts made to communicate with this section of the community in 2019 were equally successful.
- 4.1.4 One theme that we encountered in some of the feedback about warnings was that a structure that might be appropriate for a short duration incident was felt to be less so for an incident that was protracted over days and weeks. Using a standard matrix for identifying whether warnings should be issued as advice, watch and act, or emergency warning meant that some emergency warnings were in place for days, and the same information was being repeated on news media regularly even though it had not changed. There was also an extensive list of warnings and advice messages that took a long time for announcers to read through, which was felt by some to blunt the impact and make it difficult to prioritise what was important and what was less so.
- 4.1.5 We did not conclude out of any of this that Tasmanian fire agencies were at fault. The way in which warnings are classified and delivered is based on national guidelines, which were being followed faithfully. We suggest that Tasmanian fire agencies may wish to feed back into the relevant national committees the experience of people in Tasmania this year listening to the number of warnings that were being issued for the extended duration of this campaign. What, if anything, can be done to mitigate the 'warning fatigue' implications of this is in our view a question for the expert national committees to deliberate on and reach a common view about.
- 4.1.6 We heard strong support among people we spoke with for the community meetings that took place in relation to the fires. A decision was taken to live stream a number of these meetings, which was very well received and would be worth repeating on future occasions. It was clear to us from this feedback that the community meeting is a greatly-valued service provided by fire agencies and cannot be substituted by other methods of communication. Joint working between the fire agencies and local government proved particularly valuable in this regard.

Riveaux Road Fire

Geeveston – 22 and 27 January, 9 and 14 February 2019
Huonville – 27, 28, 29, 30 and 31 January, 1, 3, 4 and 5 February 2019
Dover – 30 January 2019
Cygnet – 31 January 2019

Gell River Fire

Maydena – 5, 10, 27 and 29 January, 3 February 2019
Hamilton – 5 January 2019

Great Pine Tier Fire

Bothwell – 22, 27 and 31 January 2019
Miena – 8 February 2019
Great Lake – 17 January 2019
Lynch Hill Fire
Rosebery – 28 January 2019

Western Hill Fire

Zeehan – 28 January 2019



Community Forums/Information Sessions held

- 4.1.7** We received some comment about the age of Tasmania's ICT platforms for warnings and information, the ease (or lack of it) with which people were able to obtain relevant information from the TFS website, and the lack of an app like the Vic Emergency app (Victoria) or Fires Near Me (NSW). We agree that the current ICT systems are somewhat dated, although we do not wish to detract from the work that was put into making as much information available online as possible during the fires. Inevitably, redevelopment of ICT platforms and the introduction of apps would come at a cost, and we think that decisions about updating ICT systems are most appropriately made by the relevant budget holders. We do nonetheless encourage Tasmanian fire agencies to keep this under consideration and there would undoubtedly be value in updating the current online communication products if funding became available.
- 4.1.8** We did hear some accounts of communities in isolated areas arranging for their own neighbour-to-neighbour (via landline and personal visits) updates concerning fire progress, with people commenting that the information on the TFS website was not always sufficiently up to date or granular enough to meet their needs, if it was accessed at all. In reviewing how community messaging is conducted we encourage TFS to think carefully about those that have little or no connection with the internet, as well as ensuring that products that are available online are up to date and useful for rural residents who are using them to try to assess their current level of risk.
- 4.1.9** Based on the discussions we have had with a variety of stakeholders, and feedback we received during the public consultation phase of our work, we have some observations on the relationship between the Tasmanian fire agencies and the community. This was a theme in 2016 as well, in particular in relation to engagement with community members who had a particular interest in environmental matters. This year, we heard that engagement with environmental groups had been taking place, and was welcomed by them.
- 4.1.10** There was still feedback to the effect that more information could have been provided both about what was happening, and what measures were in place to protect significant values and manage the fires more generally; but there was an acceptance as well that this can be difficult for fire agencies while operations are ongoing. We encourage TFS, PWS and STT to continue to think about how to engage with environmental groups both out of season and while fires are ongoing, not only to provide as much information as is practical to do, but also to increase awareness among the public of the very high importance that the land management agencies set on natural values and the significant efforts that are undertaken to preserve them.

- 4.1.11 Another theme we identified was in some sections of the rural community, there was a belief that TFS in particular was an urban-based service that did not have a deep understanding of rural firefighting. On the face of it we consider that this is a somewhat surprising conclusion, given both the reach of TFS volunteer brigades into rural areas, and the experience over many years if not decades that TFS leaders have in managing rural fire.
- 4.1.12 On reflection we suspect that this feedback speaks more to an issue of engagement than any genuine deficit in TFS capabilities. TFS management has a significant responsibility to engage directly with local brigades and communities to hear their concerns and discuss with them how TFS seeks to meet its obligations to manage rural fire. In turn we encourage rural community members to understand that the last 20-30 years have brought significant changes to rural fire management in terms of incident control structures, safety requirements and the way in which fire management is often now a regional and even state-level affair, and cannot be fully appreciated without understanding the broader context.
- 4.1.13 Many operational reviews in Tasmania and beyond in the last 10 years have identified the importance of local knowledge in fire management and we reinforce that message – we think that this is best achieved by ensuring that local brigades and groups of brigades are embedded in incident management structures. But we sound the note of caution that local knowledge is not to be understood as requiring (or even permitting) local units to act in silos, isolated from a coordinated approach to fire suppression and ignoring the risk and safety management principles that are now required of fire agencies by law.

4.2 TOR 3: The timeliness and effectiveness of the fire response and management strategy, including accommodating the priorities of life, property, timber production and forest asset values, and environmental and cultural values by Tasmanian fire agencies

- 4.2.1 The Review noted that the State Fire Management Council provides overall guidance through its 'Tasmanian Vegetation Fire Management Policy - 2017'. This affirms a collaborative approach to fire management planning and activities and incorporates principles to reflect and prioritise values for respective stakeholders.

Firefighting in the rural/urban interface

- 4.2.2 Historically, the highest risk to life and the built environment from bushfire in Tasmania has been associated with the rural/urban interface, where natural vegetation is found adjacent to dwellings and other buildings used and occupied by people. 'Urban' in this context is used to describe areas that have been built upon and may include smaller settlements and townships as well as larger urban areas.
- 4.2.3 The volunteer workforce of TFS has been trained and equipped predominantly to combat fire in the rural/urban interface, and indeed much of that workforce lives in communities that could be described as including interface in their risk profile. Tanker-based rural volunteer firefighters provide speed and weight of attack in the event of fire starts threatening those communities, and their success in doing so in the 2018-19 fire season is reflected both in the limited number of structures lost in interface areas, but also the focus we experienced, when speaking with people in the course of compiling this report, on issues related to remote area firefighting.
- 4.2.4 We were advised that in relation to fires that started in interface areas in the 2018-19 season, all were contained within one work period (approximately 12 hours) of starting. Financial losses from destruction and damage of assets in the interface were limited compared to other fire seasons on record. This is a testament to the efforts of rural volunteers in protecting their communities and a validation of the arrangements in place for pre-positioning resources to combat new starts on days of high fire danger.
- 4.2.5 We are mindful that the emphasis, in this section of our report, on issues relating to remote area firefighting might be seen as not acknowledging the efforts of crews that fought fire in the interface. On the contrary, we think that it is evidence of their success.

The Tasmanian Wilderness World Heritage Area (TWWHA)

- 4.2.6** The Tasmanian Wilderness World Heritage Area covers over 1.4 million hectares, or ~20% of Tasmania and is one of the largest conservation reserves in Australia. It conserves a diverse array of both natural and cultural features of outstanding global significance including temperate rainforest and alpine vegetation, complex geology and landforms of immense beauty. The region includes many rare and endangered species that are found nowhere else in the world and a history of Aboriginal occupation extending back beyond 36 000 years (PWS). Although other natural values were impacted by these fire events, the TWWHA provided a focal point.
- 4.2.7** During the 2018-19 summer fire events 36 individual fires started in the TWWHA. A number of these progressed and joined to become part of larger fire complexes at Gell River, Riveaux Road, Great Pine Tier and Moores Valley. Overall, during the course of the summer, 22 fires impacted over 95,000 ha, or 6%, of the TWWHA.

Figure 7: Hectares burned in TWWHA, 2019

Fire Name	Area Burnt (ha)
Gell River, Southwest	34,220.9
Riveaux Road, Southwest	31,557.1
Moores Valley, Southwest	9,170.8
Celtic Hill, Southwest	3,515.9
Great Pine Tier, Central Plateau	10,094.3
Dolphin Ridge, Southwest	2,914.7
Mount Solitary, Southwest	1,371.6
Lake Pedder, Southwest	1,120.7
Anne Gorge, Southwest	1,009.8
Wombat Peak, Southwest	257.8
Wilmot Range, Southwest	109.6
Jubilee Range, Southwest	59.9
Gallagher Plateau, Southwest	17.1
Nevada Peak, Southwest	4.4
Murchison River, Lake St Clair	2.5
Devils Backbone, Southwest	1.8
Hewardia Ridge, Southwest	0.9
Precipitous Bluff, Southwest	0.6
Mount Jean, Southwest	not mapped < 1 ha)
Pebbly Beach Bay, Southwest	not mapped < 1 ha)
West Coast	not mapped < 1 ha)
West Portal, Southwest	not mapped < 1 ha)
Total area of TWWHA burnt (ha)	95,430.4



King Billy Pine at Lake Rhona (credit: Guy Thomas)



The Gell River fire (credit: Warren Frey)

- 4.2.8** Preliminary desktop assessment indicates that a total of approximately 2,300 ha comprising thirteen different Threatened Native Vegetation Communities were within identified burn areas in the TWWHA. Importantly, the large majority of threatened vegetation in those areas are classified as having low – moderate fire sensitivity. This includes over 1800ha of highland grassland and sedgeland that were burnt in the Great Pine Tier fire.
- 4.2.9** Four extremely fire sensitive endemic conifer communities were fire affected. Although only small areas in terms of total population extent (<0.1 – 0.2%), these communities contain King Billy Pine *Athrotaxis selaginoides* or Pencil Pine *Athrotaxis cupressoides* that will not recover from fire.

Figure 8: Impacted Threatened Native Vegetation Communities in 2019 TWWHA Fires

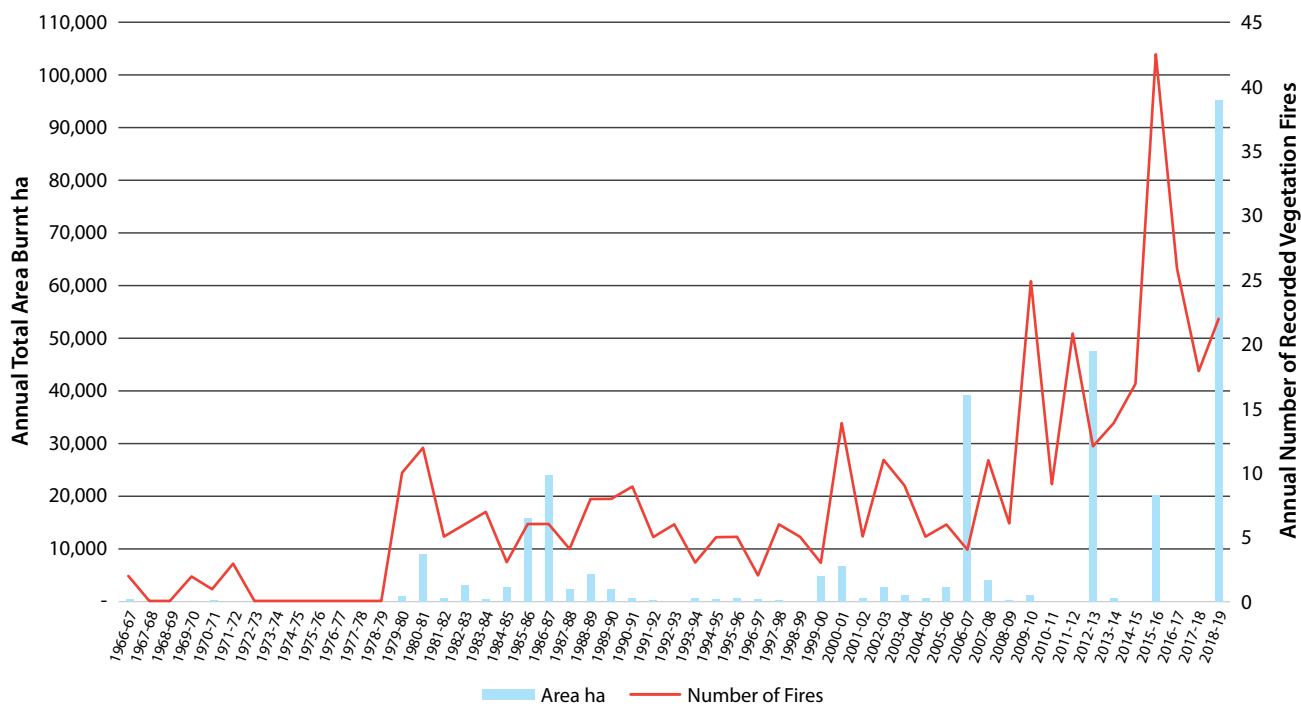
Fire areas (ha) affecting TWWHA threatened communities	Alkaline pans (L)	Athrotaxis cupressoides open woodland (E)	Athrotaxis cupressoides rainforest (E)	Athrotaxis selaginoides rainforest (E)	Athrotaxis selaginoides subalpine scrub (E)	Banksia marginata wet scrub (M)	Cushion moorland (VH)	Eucalyptus brookeriana wet forest (H)	Eucalyptus ovata forest and woodland (L)	Highland Poa grassland (M)	Highland grassy sedgeland (M)	Rainforest fernland (H)	Subalpine Leptospermum nitidum woodland (M)	Grand total
Gell River, Southwest	-	0.5	0.8	-	-	41.3	5.7	-	-	11.6	-	3.8	3.2	66.9
Great Pine Tier, Central Plateau	-	-	-	-	-	-	-	-	-	1,278.2	562.2	-	-	1840.4
Riveaux Road, Southwest	-	-	-	6.8	11.0	150.4	-	-	14.3	-	-	0.2	3.5	186.2
Anne Gorge, Southwest	-	-	-	-	-	77.7	-	-	-	-	-	-	-	77.7
Celtic Hill, Southwest	-	-	-	-	-	81.5	-	38.4	-	-	-	-	-	119.9
Moore's Valley, Southwest	-	-	-	-	-	-	-	-	-	-	-	1.2	-	1.2
Dolphin Ridge, Southwest	36.9	-	-	-	-	-	-	-	-	-	-	-	-	36.9
Grand Total	36.9	0.5	0.8	6.8	11	350.9	5.7	38.4	14.3	1,289.8	562.2	5.2	6.7	2329.2
% of Total TWWHA TNVC 2014	7.2	< 0.1%	< 0.1%	0.1	0.2	13.5	0.2	5.3	4.7	8.5	6.8	1.6	0.2	3.3
% of Total Tasmanian TNVC 2014	7.1	< 0.1%	< 0.1%	< 0.1%	0.2	13.3	0.2	0.5	0.1	4.9	3.0	0.3	0.2	1.8

4.2.10 Actual extent of fire and impacts on these vegetation communities is subject to detailed analysis and field inspection by the PWS but small permanent losses to some vegetation types is expected. Such incremental loss of fire-sensitive vegetation has conservationists deeply concerned about the future of the TWWHA, most particularly the paleo-endemic Gondwanan forests that include ancient relic species such as King Billy Pine *Athrotaxis selaginoides*, Huon Pine *Lagarostrobos franklinii* and Pencil Pine *Athrotaxis cupressoides*.

4.2.11 In a changing climate scenario these ancient forests will be subject to increasing threat from uncontrolled fire, whether from cumulative effects of small incremental losses such as has occurred in 2019 or single large-scale events that have happened in the past. Data presented to the review team demonstrates the increasing impact of bushfires on the TWWHA. Fire records are absent or lacking from pre-1980s but the increasing frequency of larger scale fire events is apparent. Notably, more area was burnt in 2019 than the previous 10 years combined.

4.2.12 The Review heard from key conservation groups, who have a strong and passionate commitment to biodiversity conservation, most particularly in the TWWHA. The groups we spoke to understand there are significant complexities associated with managing and responding to fire in very remote, environmentally-sensitive areas of the TWWHA. They are seeking greater involvement with the fire agencies to help proactively plan and mitigate misunderstandings that may occur during future bushfire events by improving the flow of accurate information.

Figure 9: 50-year TWWHA fire history data



- 4.2.13** Conservation groups expressed a strong belief that the Commonwealth Government, as signatory to the World Heritage Convention, has obligations to further support the Tasmanian Government to help protect and mitigate threats to the TWWHA from known and foreseeable risks faced by climate change-related fire scenarios. They conveyed a level of frustration with a perceived shortfall of an international commitment to protect the Outstanding Universal Values of the TWWHA in anticipation of future fire scenarios.
- 4.2.14** There is undisputed recognition and support for the protection of human life in bushfire events. However, a particularly strong notion emerged that the priority of irreplaceable high conservation-value ecological communities should be reassessed in context of critical assets. In particular, this needs to consider the relative priority of unique vegetation communities protected under international conventions against infrastructure assets.
- 4.2.15** The Review heard from some people who believed there was an apparent lack of proactive planning for natural values in the TWWHA to inform tactical resourcing deployments, and that PWS continued to use the same tactics it had deployed in the past. On the contrary, we identified that PWS had moved to provide specific tactical plans to protect vulnerable vegetation communities and other high value assets. Examples of those plans provided to the Review show they contained high quality analysis and tactics. It is apparent these were developed by a team operating under considerable pressure during the fire and included some new and innovative tactical concepts using learnings from the 2016 fires.
- 4.2.16** One such example was the deployment of a sprinkler line at Lake Rhona, an iconic location in the Wild Rivers National Park and part of the TWWHA. Our assessment is the rapid assimilation of intelligence into a plan for that area enabled a tactical deployment of resources in a timely fashion under very trying conditions, the outcome of which was successful protection of highly vulnerable vegetation communities around Lake Rhona.
- 4.2.17** Another novel approach trialled during the Gell River Fire included the protection of important cultural heritage hut assets by wrapping in protective material. Whether such a technique is ultimately considered a viable option, it indicates a willingness to trial and adapt to changing conditions and learn from experience. Importantly, the team heard that lessons were learnt that will result in further improvements in the future.
- 4.2.18** The Review heard that PWS are in the early stages of a project funded to undertake specific fire management planning in the TWWHA. This will include specific site planning to protect vulnerable natural and cultural values. Initial versions of those plans prepared by PWS staff during the fires and provided to the review Team are considered to be high quality, instructive and commended as a best practice approach to such situations.

- 4.2.19** Further developing this capability and expanding the suite of site protection plans to high value vulnerable communities is a worthy endeavour that will aid resource prioritisation and tactical decisions in future events. It is the view of the review team that well-developed, specific tactical plans, are desirable but not commonly available and commend this approach. Indeed, it is evident from the 2019 fires a number of critical community assets did not appear to have such plans in place.
- 4.2.20** The Review heard conflicting views around PWS input to priority tasking and associated resource allocation in the State Operations Centre (SOC). We discuss this in more detail later in this report. It is apparent PWS only had a liaison role at the SOC, and this primarily resulted in input during the twice-daily briefings. In previous years, PWS has held key operational roles in SOC during major events. Given the significant areas of PWS managed lands associated with the 2019 fires it may be that greater operational involvement of PWS in SOC could have mitigated some of the communication issues reported to us.

TasNetworks

- 4.2.21** The Review was told that there were several significant threats to the Tasmania's power network during the course of the fires. As critical community and economic assets for the State, considerable effort was made by multi-agency incident teams and firefighters to protect this valuable infrastructure.
- 4.2.22** Although the Tasmanian power grid has redundancy capability, the location of large fire complexes meant redundant elements of the network were exposed to concurrent threats. Of particular concern was potential for the Waddamana substation to be subjected to extreme ember attack during the Great Pine Tier fire. This risk was previously unforeseen in planning scenarios and the Review understands that no precedent existed as to what would happen if such a situation eventuated.
- 4.2.23** The Review also heard that during the Gell River fire, a threat was apparent to the transmission link from the Gordon Power Station, with modelling showing the Tim Shea communications & data facility would be threatened. Although a more minor facility, the Farrell substation was also impacted during the Britton Swamp Fire. There were real threats to continued supply of power to southern Tasmania and the BassLink mainland connector, had simultaneous impacts occurred to redundant elements of the network. While major transmission lines are generally resilient to direct fire impact, smoke or ionised particles may cause shorting and loss of transmission capability.
- 4.2.24** Apart from direct flame impact on infrastructure, issues with transmission lines are largely associated with different types of 'trips' or 'shorts'. Most commonly these are phase to phase or phase to ground. From a network perspective these are not ordinarily considered a major problem as lines can be re-energised and power restored within a relatively short period (minutes) of the fire front passing.
- 4.2.25** The Review was told that distribution networks that supply domestic power are more vulnerable to direct fire attack as these are often associated with wooden poles and limited-width corridors. They can be repaired or replaced relatively quickly compared to major transmission lines. It was noted that power supply to the Southwood forestry site had already been re-established following the loss of an old private power line which TasNetworks now owns.
- 4.2.26** There was significant praise from incident management team members about TasNetworks input to intelligence and planning, while TasNetworks appreciated the close collaboration with values assessment, prioritisation and tactical decision-making. The importance of established relationships to assist during incidents was emphasised and an invite to TasNetworks (and Hydro Tasmania) to participate and be involved in decision-making at the State Operations Centre showed recognition for the important community asset values they represented and expressed confidence in their assessments.
- 4.2.27** We heard that some contingency plans needed to be refined during the course of the event, but these were quickly resolved. There were positive views that the overall triage assessment of power network priorities was right.
- 4.2.28** One of the more significant aspects the Review team was the importance of fire and other emergency management staff understanding how power networks operate and the specific issues associated with them during incidents. This is recognised as a learning and development opportunity for emergency management staff to be provided with better information around network operations and issues to enhance their understanding in the context of incident response and operations. We think that further improvement could be supported with a similar approach to other critical community networks including water, sewage, radio and telecommunications.

- 4.2.29** The Review Team heard that TasNetworks has already begun identifying areas of improvement as part of their after-incident action planning processes. This includes specific asset protection mechanisms for critical network infrastructure. Based on information provided to the Review Team there is merit in further review of asset protection and reduced fuel buffers around critical TasNetworks community assets. There is also a need to ensure a contemporary representation and assessment of all relevant power assets in the Bushfire Risk Assessment Model to inform future fire management activity and emergency response.

Identifying Values

- 4.2.30** We heard perceptions from a number of people we spoke to that significant forest and timber-related values were not afforded appropriate levels of priority, especially in the early phases of the Gell River and Riveaux Road fires. These values primarily centred around the economic value of standing timber, forestry processing plants at Southwood and a significant tourism facility at Tahune. Such concerns gained public traction very early in the campaign, with media reports in early January claiming \$600 million worth of standing timber in a Sustainable Timber Tasmania plantation was at risk from the Gell River fire.
- 4.2.31** With any major bushfire event impacting large areas there are a variety of significant values, beyond the immediate tangible known elements, that may be impacted. In context of the 2019 Tasmanian fire events these particularly include tourism and forest industry employment and business. Other ecosystem services help support the apiary and energy (hydro) industries.
- 4.2.32** From speaking with PWS personnel and managers we heard an acute sense of awareness from the PWS about its role in supporting local ecotourism and importance of tourism to the State, especially during the peak summer months. Significant efforts and resources were employed to manage visitor safety in fire-affected national parks and establish alternate opportunities wherever possible.
- 4.2.33** Consistent with experience in other jurisdictions, there were reports of tourism being impacted by general commentary and media reporting around 'catastrophic' fires destroying wilderness and property. We heard reports that regional and local tourism and general business was affected by closure of the main Huon Valley Highway. Such closures are an important component of managing the safety of residents and visitors during these types of event and the Review's overall impression was that consideration was given to business needs where feasible. This included facilitating daily stock supply for a large local salmon producer.
- 4.2.34** Our assessment is that there are robust, scientific and evidence-based models and processes in place that identify a range of critical community, natural and cultural assets. The Bushfire Risk Assessment Model tool, which provides a spatial representation of the prioritised assets, was available to inform assessments by planners and the State Intelligence desk. We heard that significant work has been undertaken since 2016 to improve and refine the data which underpins the model however it remains a work in progress.
- 4.2.35** Most people we spoke to commented that natural and cultural values were better recognised and respected during the 2019 fires. This had been a major lesson from the 2016 fires and strongly supported by the respective heads of agencies. Certainly the review team noted there is widespread agreement and recognition of natural and cultural values from people across government.
- 4.2.36** It is widely acknowledged and accepted that during the course of these fires incident teams had to make difficult decisions on how to best protect a wide variety of disparate assets. As with any other such situation, this involved triaging and setting priorities. Regardless that asset values are weighted differently by people, or that they are not well quantified or understood, or may be difficult to effectively analyse, the Review team found that on balance, strategic and tactical resourcing decisions were consistent with generally agreed priorities. Further, we were unable to find any evidence that any assets were lost because of inadequate prioritisation.
- 4.2.37** It was a matter of concern though that, at the very least, the perception existed that the prioritisation of natural values and forest assets was subordinated to values around the built environment. TFS managers were firm in their view that this was not in fact the case, and that all values were accorded appropriate priority. But we think that there is clear evidence that there was not a meeting of minds on this issue, and that the TFS perspective is not shared by all.
- 4.2.38** We consider that the range of values at risk from bushfire in Tasmania, coupled with the separate legislative and commercial responsibilities of the Tasmanian fire agencies and other stakeholders means an emphasis must be placed on further refining currently available data and agreeing relative priorities in a planning environment well in advance of future bushfire events. The fire agencies should review current incident planning processes and command structures to ensure not only that all agencies can positively contribute to priority setting, using agreed priorities from that data, but that it is demonstrable that the objectives of all involved are addressed in incident action planning and resource management.

Use of retardant

- 4.2.39** The Review Team was aware of commentary and findings made in the AFAC 2016 Tasmania Fires Review concerning the use and impacts of fire suppression chemicals in wilderness and other environmentally sensitive areas.
- 4.2.40** Research recently published in Tasmania concluded that while firefighting chemicals cause some adverse ecological impacts, their use must be weighed up against the effect of uncontrolled bushfire. While long-term environmental impacts remain unknown, given firefighting chemicals are unlikely to be used repeatedly in the same location it concludes that cumulative effects of the chemicals should be minimal and long-term, deleterious effect on terrestrial ecosystems is unlikely⁵.
- 4.2.41** The Review team found that the PWS had responded to the lessons learnt from management of the 2016 fires in regard to use of fire suppression chemicals and, informed by the research, used an evidence-based approach to develop guidelines for the use of fire suppressant chemicals. This was assimilated into decision-support tools through the inclusion of specific spatial layers in the Tasmanian government Common Operating Platform (COP). A complementary procedural guide *'Guidance for the use of Fire Suppressant Restriction Layer on the COP'* prepared by PWS enabled the information to be available to incident teams during the 2019 fire events.
- 4.2.42** It was apparent to us, however, from some of the feedback we received, that not all stakeholders were aware of these tools and how to use them. We make the observation that the TFS, PWS and STT should all ensure that these tools are distributed to personnel who may be decision-makers in relation to the use of fire chemicals and that they are aware of how to access and use them in an operational context.
- 4.2.43** The Review team reiterates previous findings from the 2016 AFAC Review that the overall approach to fire management by the Tasmanian fire agencies to protect and maintain environmental and heritage values meets good practice standards. Additional resources allocated by the Tasmanian government that are focussed on refining the planning and management of fire in the TWWHA are expected to realise significant further improvements and help meet the challenges associated with future wildfire events in that iconic area.

Fire management: speed and weight of attack

- 4.2.44** The Review spoke with a number of people who were responsible for directing and managing fire suppression activities in Tasmania in 2018-19. We also received several public submissions in which the question of speed and weight of attack was raised. We considered this issue both generally, and in relation to specific fire starts.
- 4.2.45** It sounds like a simple principle, but is worth repeating that fires that are not subject to suppression activities, and are burning in conditions favourable for combustion, will continue to grow. It is much easier to extinguish a small fire than a large one – and there comes a point where a bushfire has grown to a size where it cannot be extinguished. This point may come sooner than is generally realised, particularly in conditions where there are organic soils which may support combustion beneath the surface, which can be hard to detect.
- 4.2.46** Many people when considering firefighting tactics will think about the example of a house fire, where the fire service is called, attends within the space of minutes, and can 'put out' the fire. Bushfire firefighting is not the same. Where fires are burning in remote areas, it will typically take some hours to commence suppression activities. As discussed later in this report, it may assist to use aviation resources to carry out initial attack, but there are no guarantees of success. And in conditions of elevated fire danger, a fire may develop to the point where it is unsafe to use ground crews to combat it in a relatively short space of time.
- 4.2.47** The bushfire firefighting community in Australasia does in our view understand and aim for rapid suppression of new fire starts. The principle of 'hit it hard, hit it fast' is familiar to bushfire firefighters across Australasia and beyond, and underpins many agencies' fire management strategies. Many inquiries and reviews of previous fire events have focused on whether fires were dealt with sufficiently aggressively at an early stage, before they could take a hold, and all members of the Australasian bushfire firefighting community can be taken to understand the point.
- 4.2.48** There are two particular issues with this principle that the Review noted in the course of our inquiries. The first is where there are multiple fire starts – after a dry lightning storm, there can be dozens of new fires in the landscape at once – and finite resources to attack them. The second issue is whether there is a clear understanding in the firefighting community of what 'hitting it hard and fast' means in practice. And both of those issues have to be contextualised against the challenges of identifying new starts in remote terrain.

5 *The impact of firefighting chemicals on the Natural Values of the Tasmanian Wilderness World Heritage Area*, Styger, 2018.

- 4.2.49** The identification of new starts can happen in a number of ways: through spotter flights organised after an event such as a lightning storm; by human observation and notification via 000; by satellite identification of hot spots, and by other intelligence gathering processes such as line scan or forward-looking infra-red (FLIR) apparatus. All of these methods come with their challenges, particularly where (as can be the case in Tasmania) a lightning storm is followed by a period of low cloud and poor visibility.
- 4.2.50** It is now common practice for spotter flights to occur after a lightning storm, and this tactic was used successfully by Tasmanian fire agencies in 2016 and again in 2019. It should be understood that even where weather conditions are clear and allow for these flights, fires may burn in organic soils or under tree canopies without emitting sufficient smoke to be seen on an initial flight. It should be expected (and is expected by Tasmanian fire agencies) that a spotter flight will not identify all new starts after a lightning event and reports will continue to come in for many days after a lightning event passes through.
- 4.2.51** When a new start is identified, the concept of ‘hitting it hard’ has to be tempered by the amount of resources available. This refers not just to numbers of firefighters, but the ability to transport them, often by air, to the relevant location. In remote areas it will often be the case that water is not used on the fire by ground crews and the only water used is dropped from aircraft, perhaps in the form of foam, gel or retardant, so again the availability of aircraft will be an issue.
- 4.2.52** The Review team did, however, hear of different levels of initial attack being applied to fires. This does not in itself suggest anything wrong with the decision-making involved, but serves to illustrate that there are ‘levels’ of attack that can be applied. A fire that ignited at Tom Thumb to the west of Hobart following the 15 January lightning strikes had significant ground and air resources applied to it, and was suppressed successfully as a result. Other new starts, in perhaps less accessible or high-risk areas, did not have the same weight of attack applied to them.
- 4.2.53** The Review is aware of other published reports on fires in mainland Australia where weight of initial attack has been an issue, including the Canberra 2003 fires, the Harrietsville fire of 2013 in Victoria, and the Wye River fire of 2015, again in Victoria. We are struck by the fact that where there is discussion of ‘hitting fires hard and fast’ (or whatever similar language is used) that is usually not quantified. It could be argued in response that it will always depend on a variety of factors such as remoteness, other priorities, etc., but we think that there is scope for the Australasian bushfire firefighting community to look more closely into what represents good practice in this area. We do not think that this would be a simple exercise, but we think that it should be possible to reach a view on certain basic questions.
- 4.2.54** We accordingly recommend that Tasmanian fire agencies initiate a discussion among their Australasian peers with a view to addressing this issue. There will be a number of variables that any discussion would have to deal with, but we think that a working group ought to be able to identify what good practice looks like in relation to the management of remote area ignitions. We suggest that the discussion would include good practice in relation to
- identifying new starts
 - predictive analysis
 - risk management of high potential fires
 - suppression activities including speed and weight of attack.
- We do not envisage that there could be a ‘one size fits all’ solution to the variety of landscapes and vegetation types around Australia, but some form of benchmarking could be conducted from which Tasmanian protocols could be developed.

Recommendation 1

TFS, PWS and STT initiate a discussion among their Australasian peers about good practice around managing new fire starts in remote terrain, to include issues around identification, predictive analysis, risk management and suppression activities. The outcome should be a document which allows for benchmarking to accepted good practice across Australasia, from which Tasmanian fire agencies can develop protocols against which the management of future events can be tested.

- 4.2.55** Arising out of this work, we would anticipate that it would then be possible for Tasmanian fire agencies to set targets for response to fire in remote areas. We have been struck by the number of submissions received by the Review that question the nature or weight of attack applied to fire starts over the 2018-19 summer, and one of the challenges in assessing these submissions has been the lack of any benchmark that we could apply. By definition, nearly all fires will be small enough *at an early stage* to be able to be suppressed, but what an 'early stage' is will vary depending on the fuels, weather conditions and topography present. We have already noted that no system of fire suppression could ever guarantee to prevent some fires becoming uncontrollable. We think that if Tasmanian fire agencies set and published targets for the number and timeliness of resources that would be dispatched to a new fire start, other things being equal, this could both help to support public debate and also pre-incident planning and post-incident analysis by agencies.
- 4.2.56** We recognise also that this discussion will often take place against a background of competing priorities, whether that is major fires burning elsewhere, or multiple new starts. We do not think that that invalidates the question of 'what do we mean by hitting it hard and fast' but instead suggests a second level of inquiry, namely, what planning assumptions do we use when deciding on what standing resource levels we require for fire protection in a given area, and conversely, how much are we prepared to pay to maintain resourcing of this nature? (Put another way, one could of course maintain a vast standing army of firefighters and aircraft able to apply a heavy weight of attack to dozens of simultaneous fire starts, but whether this would be a responsible use of public money is a different question).
- 4.2.57** One factor in this initial weight of attack will be the use of ground based remote area firefighters. We are aware that nationally and internationally, there is discussion about what the term 'remote area firefighter' means. We use it to distinguish firefighters who primarily work from vehicles such as rural fire tankers, and who might expect to use water from a vehicle for fire suppression. A remote area firefighter, as we use the term, might expect to work away from a vehicle for their whole shift; to use 'dry' firefighting techniques such as clearing mineral earth breaks for the entirety of a shift; to walk for several kilometres from a dropping-off point to reach the fireline; to work on foot in steep terrain; to be transported by helicopter; and to meet nationally-endorsed fitness standards such as the 'pack hike test'.
- 4.2.58** Tasmania only has limited numbers of firefighters with this level of training and fitness, and in the 2016 review of the fires that burned in Tasmania that year, it was recommended that Tasmania look at developing a cadre of volunteers with the necessary training and fitness to perform this role. We were told in the course of the current Review that while some funding had been provided for scoping this project, it had not yet come to fruition and there is as yet no volunteer remote area firefighting capacity in Tasmania.
- 4.2.59** We note that the NSW Rural Fire Service maintains a significant number of volunteers who are trained and have the requisite level of fitness to work as remote area firefighters, and many of these volunteers deployed to Tasmania in 2019. We consider that TFS should revisit this recommendation and establish its own volunteer remote area firefighting force. In doing so we consider that it will be important not to overlook the numbers of people who live in urban areas in Tasmania, away from traditional volunteer fire stations, who enjoy recreation in the wilderness areas of the State and already have the fitness and bushcraft skills that would enable them to be effective remote area firefighters given the proper training.

Recommendation 2

TFS should pursue the creation of a cadre of volunteer remote area firefighters. In doing so the TFS should not consider itself limited to upskilling of current volunteer brigade members, but should carry out a cost benefit analysis of creating one or more remote area firefighting units based in urban areas, in order to tap into the potential of those members of the urban-based Tasmanian community who may have advanced knowledge and skills relating to navigation and survival in wilderness areas.

- 4.2.60** We also received submissions from a number of quarters about the size of the paid firefighting workforce in Tasmania. Some of these noted that the changing environment in which STT works has led to its firefighting workforce shrinking. Others suggested that PWS should expand its workforce proportionately to the additional land area that has fallen within its responsibility following transfers from STT, and to manage the projected requirements of planned burning on its land in the future. Industrial bodies representing firefighters advocate that changing climatic conditions and the demonstrated increased fire activity of the past decade calls for increases in the permanent establishments of both TFS and PWS.

- 4.2.61** We hope that the makers of these submissions will understand that the Review is not in a position to make specific recommendations about the size of the paid firefighting workforce in Tasmania. We consider that it is self-evident that Tasmania's firefighting workforce is not currently large enough to deal with all possible eventualities without assistance from outside the State. That said, we find it hard to imagine that it ever could be, and the same could be said for any State or Territory in Australia. We also understand the point that PWS has a significantly-increased land area under its responsibility and that it is challenging for it to resource fire management – there were specific examples of that during the current season. Equally, at a management level, we noted the limited resources available to Tasmanian fire agencies to resource incident management, regional and state control teams, and the issues that this can create.
- 4.2.62** Having said that, the size of the permanent and seasonal paid establishments must be a matter for the Tasmanian fire agencies to resolve within the parameters of their budgets and having regard to other priorities. In turn, the size of those budgets is not a matter for this Review to comment on. What we do think is important is that there should be an appreciation of the resourcing challenges – which, by and large, we believe that there is – and there should be effective planning in place about how those challenges will be met in future emergencies, whether that is by growing the domestic workforce, or by ensuring that there are responsive arrangements in place for quickly obtaining out of state assistance once it becomes apparent that it is needed.
- 4.2.63** If budgetary arrangements do provide an opportunity to increase the paid establishment of Tasmanian fire agencies, it would be appropriate to reflect on whether value is best added by increasing the frontline workforce, the management level, or both. We heard feedback to the effect that increased management capability would significantly support incident management, the use of aircraft, and community engagement, and we also observed (as we discuss later in this report) the challenges of fatigue management when major incidents occur.

Bureau of Meteorology

- 4.2.64** We heard positive feedback from a number of people about the role that Bureau of Meteorology (BoM) forecasting played in building an accurate intelligence picture around current and forecast weather conditions over the 2018-19 fire season in Tasmania. Vegetation firefighters identify topography (the landscape), weather and fuel (what is available to burn) as the three key factors that influence bushfire behaviour; and of these, weather is the most variable. A BoM forecaster was embedded in State Operations during the 2018-19 fires, to provide tailored weather predictions as well as spot weather forecasts where required for ongoing operations.
- 4.2.65** One resulting product that was highly valued by personnel involved in managing the fires was a daily video-conferenced weather briefing designed to meet fire managers' needs. Inputs from the BoM weather forecaster supported ongoing prioritisation of fires and options analysis. We are of the view that having a forecaster embedded at the State Operations level in this way represents good practice, and although we understand also that it represents a budgetary impost, it is a tactic that Tasmanian fire agencies should continue to employ in the future during periods of high risk or extended operations.
- 4.2.66** Against the background of the general discussion above, we turn to consider some specific issues that were raised with the Review around the management of individual fires. Comment about the statewide command and control arrangements is dealt with separately later in this report: this section focuses more on strategies and tactics for the management of individual fires.

Gell River

- 4.2.67** The Review team heard a number of comments, from several different perspectives, to the effect that the Parks and Wildlife Service did not apply sufficient resources to the Gell River fire in the early days, such that it became uncontrollable and took a major run down the Vale of Rasselas, threatening significant environmental and commercial values, as well as the town of Maydena.
- 4.2.68** The progression and management of the Gell River fire has been referred to earlier in this report. In considering the complaint that not enough was done to suppress the fire in its early stages, we took account of a number of factors. While there was some competition for resources from the fire on Bruny Island, we did not get the impression that the Gell River fire was starved of resources. We also heard a suggestion that response to the Gell River was hampered by a lack of aircraft, but we do not think that that is the case. The aircraft that were contracted under national arrangements were available at the time this fire started, and were used to transport fire crews to the fire on the same day that it was detected. This was in accordance with the PWS bushfire response plan for 2018-19.

- 4.2.69** One significant issue that was confirmed to us from a number of quarters is that it was believed at one point that the Gell River fire was out. This proved not to be the case, and is further confirmation (if any were needed) that it can be hard to detect and monitor fire burning in organic soils in wilderness areas. Crews withdrew from the fireline at Gell River on 31 December 2018, on the understanding that the fire was inactive and did not pose a threat. This unfortunately proved not to be so, with the fire later burning freely to the south.
- 4.2.70** We understand that crews sought assistance from an aerial intelligence gathering (AIG) aircraft at this time, which might have been helpful in identifying invisible hot spots. Such an aircraft was not, however, based in Tasmania and we understand that one was not available. Crews did use land-based thermal imaging cameras with no result, and it is not possible to say that an AIG aircraft would have identified the hot spots that later flared up, or made any difference to the outcome, although it would certainly have presented an additional opportunity to do so.
- 4.2.71** The problem with an event of this nature is that it is easy with the benefit of hindsight to describe an alternative reality in which more resources were applied to a fire to prevent it from developing in the way that it did. The question should not be whether such an alternative reality could have existed, but whether there were specific indications that should have been known to the relevant incident managers that they failed to act on. People that the Review spoke to about this fire – including people involved in managing it – all agreed that with the benefit of hindsight more resources could have been used. However, they also made the point that with the information available to incident managers at the time – specifically, reports from the fireground of no fire activity and that the fire had apparently been successfully suppressed – it would not have made sense to incident managers at the time to apply more resources to this fire.
- 4.2.72** Nor has a specific scenario been outlined to the Review that would demonstrably have led to a better outcome on the Gell River fire – it is possible that more resources could have been applied to it and it would still have ended up running down the Vale of Rasselas. Overall, the Review team concluded that whereas this fire can be seen as a learning opportunity in the form of a case study for future fire managers to consider, it would not be fair to castigate the personnel who managed the Gell River fire in its early stages, and other competent fire managers may well have taken the same approach as they did.

Riveaux Road

- 4.2.73** The Riveaux Road fire started on 15 January as a result of the lightning event of that date. There were a number of distinct points of ignition, one of which was at Pear Hill west of Geeveston. The Review team heard an account from multiple sources that suppression activities did not take place on this fire for a number of days, although it was accessible and remained relatively small, owing to a dispute between PWS and STT over whose responsibility this fire was. Around 21 January this fire took a significant run and was the fire that burned into the Southwood industrial complex, causing significant damage to assets there as well as burning a substantial area of forest.
- 4.2.74** We inquired into this event and were able to speak to personnel from both PWS and STT who were involved in the early stages of the fire. It became apparent that there was no basis for the suggestion that there was a dispute over who was responsible. The fire was burning on land in PWS's tenure, very close to a STT reserve. However, PWS resources were heavily committed to a fire to the south at Hastings Caves, and PWS did not have the resources to be able to combat the Pear Hill ignition.
- 4.2.75** Following the lightning event of 15 January, STT had deployed resources to new fire starts in the Huon Valley on land managed by STT, and was also working with PWS at the Hastings Caves fire. STT had some resources available to direct to Pear Hill, and so by agreement between the agencies, STT resources worked on this fire. By 19 January there were two TFS light units, two dozers, an excavator and a bulk water tanker working on this fire together with two PWS crews.
- 4.2.76** The Review heard from personnel who were working in the Southern ROC at Cambridge that the Pear Hill fire had been identified on 19 January as one of significant concern using predictive analysis techniques. This fire together with the fire at Tom Thumb were considered to be the two fires in the Southern Region with significant potential for spread if not suppressed. The Tom Thumb fire, as mentioned above, was the subject of a high level of suppression effort due to the perceived threat to Hobart, and objectives were successfully achieved with that fire being contained. The same is not true of the Pear Hill fire. We did not think that the weight of attack on the Pear Hill ignition could be described as 'hitting it hard and fast' and this was reflected in the fact that crews on the ground were unable to extinguish this fire or stop its slow spread.

- 4.2.77** We will discuss Tasmanian multi-agency coordination arrangements later in this report: we would however observe that they do not seem to have worked well in the case of the Pear Hill fire. TFS was aware of the fire's potential but does not appear to have taken steps to ensure that resources were directed to the fire proportionate to that potential. The PWS and STT crews on the ground do not appear to have had an understanding of the threat that this fire posed (and there is no reason that they should have done, if they were not informed of the predictive analysis referred to above), and despite the fact that their suppression operations were not meeting with success we found no evidence that resource requests were escalated in line with that threat.
- 4.2.78** We have not commissioned any fire progression modelling to show what would have happened if the Pear Hill ignition had been successfully controlled, and we are mindful that there were other points of ignition in the area that also developed significantly and contributed to what is now referred to as the Riveaux Road fire. We are bound, however, to conclude in relation to the Pear Hill fire that it was not treated in a joined-up way as a significant threat to life, property and the environment in the Southern Region of Tasmania. We will consider in relation to our fifth term of reference how State arrangements might be reviewed to avoid a repetition in the future.

Great Pine Tier

- 4.2.79** An issue that was raised with the Review team from more than one source was that in the early stages of the Great Pine Tier fire, permission was denied for an earthmoving machine to be used to create firebreaks on land controlled by PWS, causing a suppression opportunity to be lost. We spoke to an individual who told us that he had made a request to the Regional headquarters that was denied.
- 4.2.80** In order to assess this account, we spoke with the person within PWS who was responsible for authorising the use of machinery on PWS land. He was able to tell us that there was no blanket ban on the use of machinery on PWS land; that he had authorised the use of machinery on PWS land twice, both times within 30 minutes of the request being raised; and that in relation to the particular occasion in question, he had received no request for authorisation and if he had done, he would have approved it.
- 4.2.81** We have no reason to doubt this first-hand account and so we conclude that the suggestion that PWS was responsible for refusing permission to use machinery on this occasion is inaccurate. Unfortunately, the identity of the person to whom the request was made is unknown, because the person who made it did not make a log book entry or other note about it. It has accordingly not been possible to take our consideration of this issue any further. This issue underlines the importance of logging significant decisions and incidents so that they can if necessary be addressed in after-action review processes.
- 4.2.82** Because PWS has assured us that there is no blanket ban in place on the use of machinery on their land, we suggest that if there is any lesson to be taken out of this occurrence, it is that both PWS and TFS should ensure that all relevant personnel are aware of the contact details for relevant decision-makers for matters such as the use of machinery on PWS land so that requests of this nature can be expedited. It is also important that TFS, PWS and STT make it widely known that there are no blanket bans on the use of machinery anywhere in the State and that requests need to be referred to the correct person so that they can be considered on their merits.
- 4.2.83** As a footnote, we observe that a significant percentage of PWS land would be inappropriate for the use of machinery owing to the risk of it becoming bogged in soft ground or otherwise stuck or stranded. Requests to use machinery have to be considered against the viability of doing so and of course the undesirability of using heavy machinery in sensitive natural and cultural areas where impacts could be long term or permanent.

4.3 TOR 4: The impact and effectiveness of fuel management programs in the fire affected areas on the management and containment of the fires

- 4.3.1** Tasmania has 10 legislated Fire Management Areas, for which Fire Protection Plans are developed annually by Fire Management Area Committees. The Fire Protection Plans are coordinated by land managers and identify the priorities for risk reduction actions within their area, using a combination of modelled bushfire risk and local knowledge. Risk assessment processes take into account a range of community, economic, natural and cultural values which inform the planned burn programs. This is delivered using a tenure-blind approach through a collaborative multi-agency planned burning program of work.

- 4.3.2** A risk re-analysis is undertaken for each Fire Management Area to determine the annual relative risk profiles and impact of fuel reduction burns on relative risk reduction. The 2018 risk re-analysis has shown that bushfire risk reduction to communities has occurred in six of the 10 Fire Management Areas as a result of fuel reduction burns. The Tasmanian State Fuel Reduction Program aims to significantly decrease bushfire risk and attain a State risk rating below 80%. This is being delivered through a \$45 million investment over five years between 2017 and 2022. Information provided to the Review Team shows gradual progress is being made toward that target with an April 2019 risk level of 82%.
- 4.3.3** The state-wide risk has reduced by 4% over the last four years, a notable decrease at the whole-of-state scale. Risk is currently at its lowest level for 15 years and on track to meet the Fuel Reduction Program 2022-23 target of 80%.
- 4.3.4** We were informed that there are various administrative provisions in place between the three fire agencies to manage the governance and financial arrangements of the Fuel Reduction Program. Some comments were made about administrative burden associated with those arrangements and opportunities may exist to reduce this.
- 4.3.5** The Review heard that the creation of a Planned Burn unit in TFS has started a journey of improved understanding, with all agencies gaining a broader appreciation of values in landscape. There were also reports of positive engagement with the community and volunteer firefighters associated with the program.
- 4.3.6** The program has matured significantly and is considered to be strategic, appropriately resourced and relatively successful at achieving targets. By design, focus of the program is on fuel reduction rather than broad landscape outcomes. The agreed target or outcome for fuel reduction in Tasmania is represented as a risk reduction target of 80%. This notionally includes a minimum annual target of over 30,000 ha but typically around 20,000 ha is achieved.
- 4.3.7** In response to a recommendation from the 2016 Tasmanian Wilderness World Heritage Area (TWWHA) Bushfire and Climate Change Research Project from 2017-2018 the Tasmanian Government committed \$500,000 per annum of the Program budget for strategic landscape burning in the south west wilderness areas of Tasmania to help protect iconic vulnerable natural assets. We were told that as part of this funding initiative, work is currently underway on a strategic fire management plan for the area. The team was advised this funding is providing the additional capacity necessary to develop and refine fire planning products for the TWWHA and will assist future planned burning and bushfire suppression tactical considerations.
- 4.3.8** Favourable weather conditions during Spring 2018 resulted in 34 fuel reduction burns being conducted over nearly 14,000 hectares. These included strategic burns to protect communities, assets and World Heritage values.
- 4.3.9** Planned burns conducted in the past five years have contributed to ameliorating fire behaviour and subsequently mitigating the intensity and extent of the 2019 fires. Of particular note, a planned burn conducted at Montana Flats north of the town of Zeehan in February 2017 has been credited with preventing spread of the Western Hills fire and containing it to the north of Heemskirk Road. Other planned burning conducted in the previous five years immediately to the north of Zeehan is also likely to have afforded protection. It is the opinion of experienced fire managers that without these fuel reduced areas there is a high likelihood the fire would have encroached on the Zeehan township.
- 4.3.10** A planned burn in 2015 at Denison Gap, north of the Vale of Rasselas, is considered by PWS fire managers to have moderated fire behaviour and limited fire spread to the north of the Gell River fire. In the Southwest National Park, a planned burn conducted at Rocky Point in 2018 helped protect a weather station and provided containment for the Moores Valley fire. Other burning at Pass Hill in 2018 & Giblin River in 2015 appear to have significantly influenced containment of the Dolphin Ridge fire.
- 4.3.11** Due to rapid fuel accumulation and general flammability of buttongrass moorlands it was noted that previous planned burns and fires had limited effect on fire progression in that vegetation type. Analysis is likely to show that previous burnt areas, especially in forest communities, mitigated fire behaviour, with corresponding reduction in fire intensity. This would also reasonably be expected to contribute to further mosaic patchiness in those areas. The Review heard that previous planned burning of button grass plains in vicinity of the Ta Ann plywood mill site at Southwood had provided an opportunity for firefighters to conduct backburning under more favourable conditions and this action may have had a positive effect on the ultimate survival of the mill site.
- 4.3.12** Bushfire planning, preparedness and risk mitigation in Tasmania is informed by fire management agencies using several computer modelling tools including Phoenix RapidFire and SPARK. Another primary modelling tool used by agencies is the Bushfire Risk Assessment Model (BRAM). This tool has been redeveloped in recent years in collaboration with the Antarctic Climate and Ecosystems Co-operative Research Centre and is designed to be consistent with the National Emergency Risk Assessment Guidelines.

- 4.3.13** BRAM has been updated and refined since the 2016 fires, including the addition of cultural and heritage values. The model includes a wide range of stakeholder interests and values and there is a strong commitment by the Parks and Wildlife Service to keep refining the model, noting its major shortfall is the quality of available data. The Review Team acknowledged the substantial effort and investment to develop the BRAM to its current form. On-going work and investment to realise further improvements to the model are encouraged and supported.
- 4.3.14** It was reported that ownership and governance of the BRAM currently rests with the Parks and Wildlife Service. For maximum benefit and impact, the model requires multi-agency involvement. Within the limits of data security and integrity, it should be readily accessible for input and export of relevant data by relevant agencies and stakeholders.
- 4.3.15** We noted the now well-established Planned Burning Operational Guidelines used by the Tasmanian fire agencies to inform their fire management programs. Such guidelines provide parameters to meet specified objectives and outcomes and are acknowledged as a best practice approach. We were advised an update has been undertaken since originally prepared and such periodic reviews are important to reflect emerging knowledge and evolving conditions.
- 4.3.16** Conservation group representatives we spoke to acknowledged the role of planned burning to maintain healthy ecosystems. They expressed a desire to strengthen engagement with fire agencies to better understand values assessment, risk models and proactive burning practices. The Review was told that conservation groups recognised efforts from the PWS to improve information during these fire events compared to previous fires. They would have preferred more frequent updates but appreciated the significant nature of these fires and that the attention of fire agencies was rightly on tackling the fires.



Prescribed burning, Orford (credit: Deb Sparkes)

- 4.3.17** Public submissions received by the Review indicate some people, especially those in rural areas or experienced in land management, believe more fuel reduction planned burning should be undertaken to mitigate against large bushfires.
- 4.3.18** A number of people made observations that some common factors have contributed to a reduction in rural fire management activity and capacity in recent decades. Reasoning for this is complex however it is recognised there are several key contributing factors. These include significant changes to land management practices and changing workforces that have resulted in a reduction of experienced rural and forest fire managers. The associated loss of cultural knowledge and experience has led to reduced capacity and capability to undertake fire management activities.
- 4.3.19** The review team heard about restrictions on planned burning due to smoke management requirements associated with air shed pollution mitigation in the Greater Hobart and Derwent Valley areas and potential wine grape taint in the viticulture industry. No evidence was presented to suggest smoke management restrictions curtailed any planned burning that would have influenced this fire event. However, as windows of opportunity for planned burning are expected to narrow as land use practices and climate continue to change, these restrictions may present an increasing impediment to future planned burning.
- 4.3.20** Some submissions made to the Review stated that applications for planned burning on private land have been rejected due to fire sensitive vegetation or wildlife species. Some of these areas were reported to have subsequently been severely burnt during the recent bushfires. Others suggested that increased governance and administrative requirements may be impacting fire management activity, while acknowledging the associated risks. We encountered a belief that there is an unnecessary amount of bureaucracy associated with the planned burning process and administrative 'red tape' has resulted in lengthy and resource-intensive processes to support fuel management outcomes.
- 4.3.21** It is beyond doubt that attitudes to burning have changed over time, and it comes as no surprise to us to hear that there are greater restrictions in place than previously. Unfortunately, the history of escapes from fuel reduction burns in recent history (and in mentioning that it would be wrong to ignore the circumstances of the Black Tuesday fires in 1967 in Tasmania) demonstrates clearly that fuel reduction burning can be a high-risk business and we would not think it appropriate to make any recommendation relaxing current rules and regulations around burning.
- 4.3.22** What we can say is that fuel reduction burning by private landowners is potentially a valuable contribution to risk reduction in the State, alongside that conducted by government agencies. We would therefore encourage TFS and PWS in particular to consider how they are able to work closely with private landowners in order to support responsible burning practices on private land as part of the Statewide effort to manage risk, and also to look at current processes around obtaining permits to burn so as not to place any unnecessary obstacles in the way of private landowners who wish to conduct fuel management burns on their own land in a responsible manner.
- 4.3.23** The Review heard that there were occasionally competing priorities to conduct planned burning. This primarily relates to PWS staff being redirected from landscape 'conservation' burning to undertaking identified priority planned burns under the State Fuel Reduction program. This includes carrying out burning on private property. While the primacy of that program is not questioned, consideration should be given as to the extent of any opportunities lost by PWS to undertake larger burns that provide significant mitigation outcomes in the broader landscape. It is noted however that PWS has employed five key staff to support fire management in the TWWHA since 2016 and that program is only just reaching its potential.
- 4.3.24** The Review was advised that TFS has recently established a new position to help manage and mitigate prioritisation challenges associated with the Fuel Reduction Program and commend efforts to maximise planned burning across all programs in available windows.
- 4.3.25** With consideration of Tasmania's future climate outlook we flag that there may be a shortfall in current PWS capacity to undertake the extent of planned burning desired or required across national parks and its other estate while striving to resource priorities under the State program. As previously noted, windows of opportunity for planned burning in Tasmania are heavily constrained by a range of natural and human factors. Fuel management programs need to take into account the 'opportunity cost' associated with not completing planned burns and the impact risks of extreme bushfire events.

- 4.3.26** While the Review does not consider it appropriate to make suggestions in relation to specific numbers of personnel that should be employed in this work, we note that prescribed burning is a particular skill set and includes the ability to appropriately measure risk and be able to balance the need for public safety against the importance of not being too risk-averse such that good opportunities to conduct prescribed burns are missed. For these reasons, having an adequate workforce specifically trained in fuel reduction burning and associated risk management is a requirement for the State. We take the view that it is a matter for PWS to identify if it has adequate resources with the relevant skill sets available to it, and make budgetary submissions accordingly.
- 4.3.27** Reflecting on comments made to the Review and drawing on the experience from other jurisdictions, planned burning plays a number of important roles beyond fuel and land management functions and sustaining ecological processes. In the Tasmanian context, where major bushfire seasons have been intermittent, it provides valuable training and development opportunities and builds capacity and capability among paid and volunteer firefighters alike. This establishes a state of readiness across seasons with the available cohort of firefighters.
- 4.3.28** Planned burning and other fire management activities also provide important rural extension and community outreach opportunities. Fire agency staff and volunteers are widely respected and primarily interact during incidents or under emergency response conditions. Having the broader community experience fire management activity in the landscape under moderate conditions helps establish awareness of the importance of active fire management and build familiarity and appreciation of the associated physical, psychological and environmental effects. From planning through to implementation, planned burning and other fuel management activities are ideal times to build relationships within and between the fire agencies, their volunteers and the wider community.
- 4.3.29** The Review team had the opportunity to travel through fire-affected areas in the south of the State and our observations led us to have some concerns about township level fuel management. We saw a number of examples of properties and communities that would be very hard to defend in adverse conditions. We consider that greater focus needs to take place on township protection planning and fuel management, and responsibility for this needs to be clear at a local level. We are of the view that this presents a significant future risk to life and property in the State of Tasmania. We therefore recommend early and robust policy-level consideration of who is responsible for planning for and carrying out, or enforcing, fuel management at a township level. If this is unclear or ineffective, consideration should be given to making this a statutory responsibility of TFS.

Recommendation 3

TFS should initiate a policy review (seeking support from government as appropriate) to clearly identify what body or agency is responsible for planning, carrying out and enforcing fuel management on private property at a township level. If current arrangements are unclear or ineffective, TFS should request government to consider making this a statutory responsibility of TFS and provide any additional funding required to support this function.

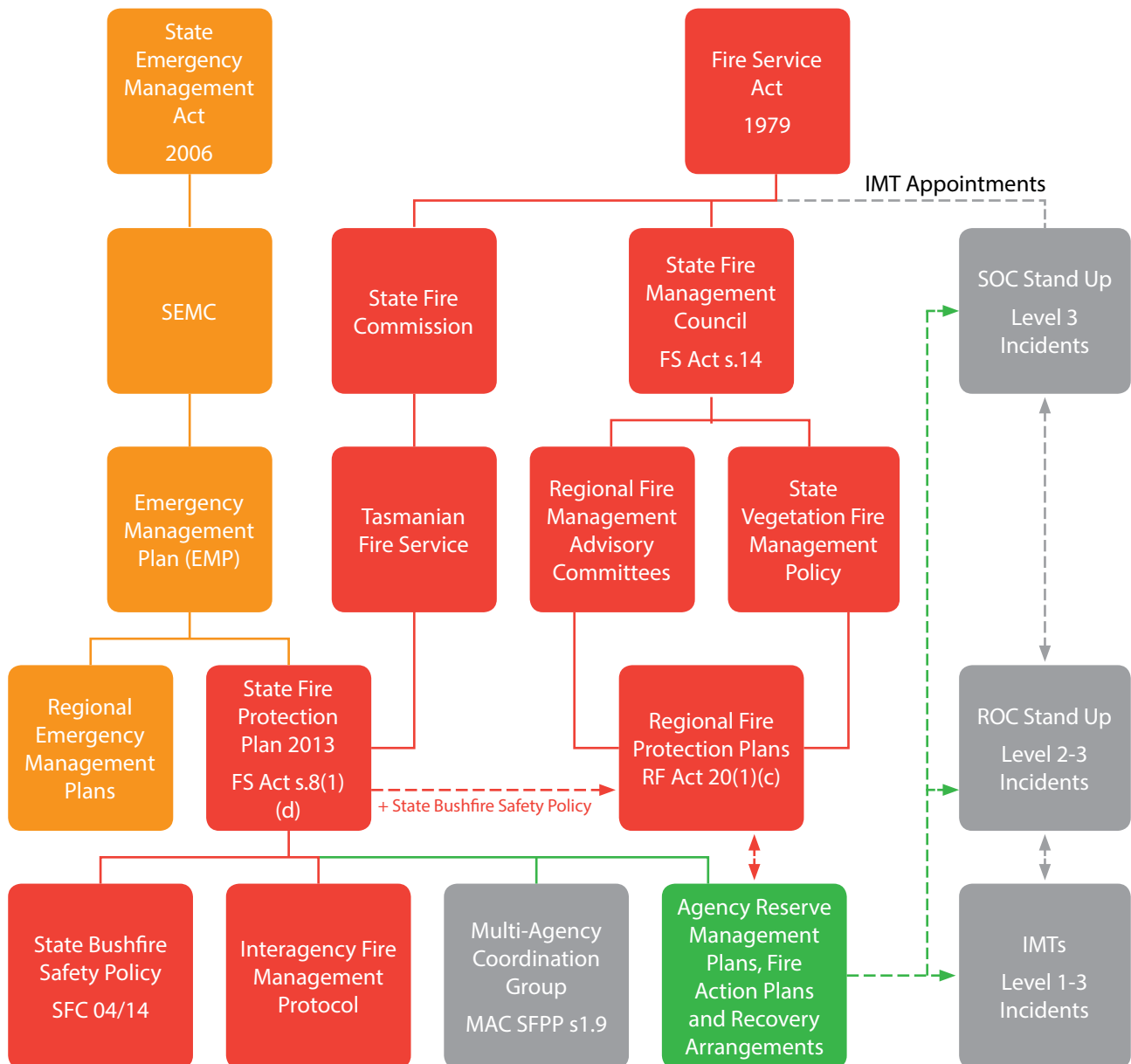
- 4.3.30** We also make a broader recommendation in relation to current fuel management programs in Tasmania, which acknowledges current efforts to maintain a fuel management program that takes into account different risks, objectives and communities, and encourages that direction of travel to be maintained collaboratively into the future.

Recommendation 4

TFS, PWS and STT should work with government and each other to continue to pursue a whole-of-state fuel management and burning program that encompasses all land tenures, meets the range of outcomes required by the state (township protection, risk reduction and landscape-scale burns) and is inclusive of private landholders and local communities as well as all fire agencies.

4.4 TOR 5: The effectiveness of state, regional and local command, control and co-ordination arrangements, to include agency interoperability and the co-ordination of emergency management activities with government and non-government organisations

Tasmania has evolved a complex management structure for fire management and operations.



- 4.4.2** Tasmania's command, control and coordination (C3) arrangements were once again seriously tested over a number of months this summer. Associated operations, structures and facilities with attendant resources and personnel were rapidly escalated in scale and scope from late December 2018 and only wound down in late March 2019. The fires involved practically every government agency, a range of non-government agencies, volunteers from far and wide, supported through a very substantial deployment of interstate and New Zealand assistance.
- 4.4.3** The policy, systems and processes in support of such complex and large emergency management operations have been tested, and extensively scrutinised, in recent times: after the 2013 bushfires and post 2016 bushfires, as well as the 2016 floods. As a result, Tasmania has continuously improved how it operates in the lead up to, and during such trying times. The Review heard that there was a real desire to keep learning and improving – this 'peer' review is evidence of that approach. That said, there are observations that the Review can make that can provide the impetus to improve how major, multi-tenure bushfires can be better overseen and managed across the many organisations and individuals that must (of necessity due to statute or policy) take an interest in the best outcomes for their part of the picture and for the State as a whole.
- 4.4.4** Firefighting of the scale and scope experienced in Tasmania in 2019 is a serious, expensive and complex undertaking. The tasks of coordinating, controlling, and within organisations commanding this effort cannot be carried out lightly. There is much at stake and those in charge carry a heavy burden on behalf of the community.
- 4.4.5** The Review heard, almost without exception, high praise for the efforts of firefighters and volunteers on the ground. Naturally, after such a vastly impactful event, the review has heard and read much about how well, or not, management and leadership worked – essentially C3 arrangements. As mentioned earlier in the report, this review will not address tactical operational issues that arose, leaving such matters to the many organisational post-incident reviews.

State-level management

- 4.4.6** It is evident that the TFS took a primary role in state-wide fire management this year, the TFS having been established as the lead fire agency through the Interagency Fire Management Protocol ('the Protocol') made between the three fire agencies. The SOC was the focal point for state-level decision making and structures were established in keeping with this function. Though this does not differ markedly from 2016, there have been some subtle changes that affected collaboration and communication across and within agencies.
- 4.4.7** It was evident to us that there had been a long history of cooperative arrangements in place that have worked reasonably well in the past. Evidence of this is apparent in the Protocol, that sets out bushfire response arrangements, including responsibilities and contacts. One of the key features of the Protocol is the Multi-Agency Coordination (MAC) Group, comprising senior representatives of the three primary fire agencies – TFS, PWS and STT. The review heard that the MAC Group had proved its worth since its inception some years ago as a result of learnings from Tasmanian personnel deploying to the USA where similar groups are established. In contrast to reports from 2016, when the MAC Group had generally been assessed as working well, some felt that the group was not effective to the extent that at least one respondent was under the impression that it had been disbanded.
- 4.4.8** We found that state-level strategic decision-making and resource allocation was not always as clear cut and cooperative or integrated as it could have been. The TFS took a lead role at most times, with foremost regard for the primacy of life. However, it was apparent that there was not always a joint understanding of the situation and all of the values and interests involved between TFS, PWS and STT staff. Naturally, agencies differ in statutory responsibilities and therefore values emphasis. The Protocol was intended to resolve this, but based on the information gathered by the Review there are significantly differing perspectives on whether this was achieved in 2019.
- 4.4.9** There is no doubt that resourcing across multiple demands and agencies is very challenging. The original intent of the MAC Group was to provide a decision-making environment in which the different priorities at play could be addressed and a common approach agreed. The challenge in 2019 appears to have been that the MAC Group was not formed of executive decision-makers and so the discussions and conclusions reached within that Group then had to be processed through another tier of decision-making at SOC level before being turned into operational outcomes on the ground.

- 4.4.10** It was clear to the Review team that the TFS has, with all the right intentions and with the agreement of the other agencies, taken a leadership stance concerning all fires state-wide under the Protocol. However, and noting the observation concerning the status of the MAC group above, we concluded that the recent incremental shift by TFS to lead in fire Statewide is not consistently applied. For example, as discussed above, during the early stages of the Riveaux Rd fire, we did not get the impression that the TFS took an active interest in matters, rather leaving it to the land managers to sort out.
- 4.4.11** It is our view that the Protocol is no longer operating as was intended. Though designed and implemented with the best of intentions, to provide for an integrated and agreed interagency framework for bushfire response, it is now dated and in need of renewal. Though action can be taken in the short term to improve the Protocol, legislation should also be updated to better underpin operational doctrine.
- 4.4.12** The *Fire Services Act 1979* is currently the subject of a review being undertaken by a government appointed steering committee, chaired by an independent chair Mr Mike Blake. While there will be a number of different perspectives brought to that review, we offer some suggestions about how the legislative framework could look, based on our observations of how the system worked in practice this year:
- The current approach where each of TFS, PWS and STT have authority (and accountability) to manage fire on their respective tenures should continue. The way in which land managers use fire differs in marked respects from the way in which a fire suppression agency such as TFS will do so, for example in the use of fire as an ecological tool and promoting biodiversity. As there will be experienced fire managers in each agency, it makes sense for them to continue to undertake suppression activities on unwanted fires within their tenure.
 - The system needs however to be scalable and there comes a point where there should be a single point of accountability for significant unwanted fires burning in Tasmania (this excludes planned burns, to which different considerations apply). While it is reasonable to expect agencies such as PWS and STT to be responsible, so far as they can, for fires burning on their tenure and that do not threaten to spread into another tenure, there is a need to manage significant fires on behalf of the State when individual agencies are unable to manage them effectively whether through resource constraints or otherwise.
 - The TFS should be given this overarching responsibility, and should be given powers to declare a significant fire, or complex of fires, that then come under the direct control of the Chief Officer. To be clear, it should be the responsibility of TFS to identify and declare such fires, and while there should be a statutory obligation of cooperation on other agencies, it should be explicit that TFS is accountable for the management of significant unwanted fires in the state.
 - It is a complicating factor that TFS, PWS and STT have different statutory objectives. If TFS is given overall responsibility for managing major fires in Tasmania, it should also be made clear that they are accountable, in doing so, for preserving not only life and property, but preserving environmental values and timber production assets. This should be made explicit in legislation, and a mechanism should be included, even after TFS has declared a fire to be significant and therefore under TFS control, for PWS and STT to be able to make formal representations about the objectives of concern to them, that TFS would have a statutory duty to have regard to.

We understand that the process of consulting on, and then drafting and passing, replacement legislation may not be concluded before the next fire season. With that in mind, we consider that Tasmanian fire agencies should agree on an updated version of the Protocol that will address some of the areas in which it was found wanting this year. Specifically:

- The current concept of having regional IMTs led by TFS appears to work well and should be continued.
- State-level liaison during significant fires needs to be carried out between executive decision-makers – this will in practice require the functional heads of TFS, PWS and STT to talk on a regular basis and to issue joint direction to incident managers about objectives and priorities. We felt it to be a weakness that MAC Group membership had effectively been delegated to individuals who were not the decision-makers in their agency, so that the MAC Group was not making decisions but was developing proposals that had to be implemented (or not) through the SOC.
- While there needs ultimately to be one point of control for State fire management – the principle of Unity of Command – we think that this control needs to be exercised explicitly with the aim of reaching consensus between agencies and meeting all stakeholders' statutory objectives – the principle of Unified Command.
- It may require some discussion out of season about how financial issues are to be reconciled; but if one agency sees a need for a particular resourcing level to meet its objectives and is prepared to be accountable for the relevant costs, then we think that that should be given effect. If some of those resources then need to be diverted to other priorities, then they should be backfilled. This is consistent with the principle that all agencies' objectives need to be respected as part of a Unified Command ethos, and adequately resourced.



An IMT briefing during the 2019 fires (credit: TFS)

Recommendation 5

TFS, PWS and STT agree an updated version of the Interagency Fire Management Protocol which maintains the principle that there will be one state-wide point of command for major unwanted fires burning in the State of Tasmania, explicitly recognises the right of each of TFS, PWS and STT to have their objectives prioritised in incident action planning and adequate resources applied to those objectives, and provides a mechanism for executive decision-makers from TFS, PWS and STT to come together and agree objectives and resourcing levels that will then be operationalised by whole-of-State control structures.

- 4.4.13** In terms of state-level liaison with emergency management, support and infrastructure organisations, the Review noted that emergency management and partner agencies were kept well informed and included in decision-making when required. For example, TasNetworks were particularly pleased with their interaction with senior TFS personnel at the SOC and the regard for their technical advice. The Review did hear that the broader emergency management arrangements involving police and other agencies may not be as widely understood as they should be. We saw many well thought out documents concerning emergency coordination and in particular recovery transition. There was a sense that more could be done to familiarise (or perhaps re-familiarise) fire, land management and local government staff concerning these arrangements.
- 4.4.14** This report would not be complete without commentary concerning the configuration and capacity of the existing SOC. Located in the TFS headquarters, the core of the SOC is one board room with the usual array of displays, computers and communications devices in open plan with little separation. Overflow is by way of expansion into otherwise fully utilised office space and meeting rooms throughout the building. The same building houses the TFS 000 communications centre ('Firecom') and the Hobart fire station.
- 4.4.15** During the fires, the review heard of the PWS setting up a dedicated natural and cultural values planning cell within their head office building located elsewhere in the Hobart CBD. The Police and the many support organisations were accommodated in the SOC on an as-needs basis. Little established or dedicated capacity sufficient to meet the needs of senior liaison officers from these organisations existed. Compared with most other mainland fire and emergency services, the TFS's SOC facility is, in the Review's opinion, somewhat dated and barely adequate to the task. If the TFS is to be accountable for all unplanned fire in Tasmania, and be able to properly accommodate and integrate the needs of partner agencies such as PWS during times of crisis, the facility will need to be substantially reconfigured and expanded.

State, Regional and local level coordination

- 4.4.16** The review heard many stories of how well the TFS (and their volunteers), PWS, STT and local governments worked well together as one at the regional and local level. As one PWS commentator noted: "I was representing a combined firefighting force; agency was secondary".
- 4.4.17** We have considered again the question of how the tiered approach of SOC, ROC and IMT works in Tasmania. The 2016 AFAC Review suggested that consideration be given to whether the ROC adds value at a time when level 3 IMTs are stood up and the SOC is in place.
- 4.4.18** Our initial thought was that the ROCs were redundant in such a situation and that the ROC level should be dispensed with where a full level 3 IMT is in place in a Region. This is partly influenced by the current practice that only one level 3 IMT will ever be in place in a Region, and the obvious point that having a ROC as well as a level 3 IMT and a SOC is resource-intensive in a state that has significant resource constraints.
- 4.4.19** In talking to practitioners across Tasmania, however, we were persuaded of the value of having a level of regional oversight, so that the solution may not be as simple as getting rid of that level altogether. We do consider, though, that the following principles need to be borne clearly in mind:
- We offer some professional challenge to the name 'Regional Operations Centre' as perhaps overemphasising the appropriate level of resourcing and structure for this function. We think that a 'Regional Controller', supported by a small executive staff, should suffice.
 - it is important to recognise that the Regional Controller role needs to integrate operations between TFS, PWS and STT, so that it is more than just an agency regional manager role – this could be supported by having other agencies represented on the Regional Controller's executive staff.
 - Where there is a level 3 IMT, the Regional Controller should not compete with it in the operational space. The Regional Controller can oversee and support, but the incident controller should maintain responsibility for operational matters within the incident.
 - Where effectively there is one IMT running all major fires in a region, it is the incident controller, not the Regional Controller, who should be reporting to the State Operations Centre. Incident Controllers must have competent deputies who can take charge of routine business while the IC is carrying out the important function of 'up and out' reporting. It may be appropriate for the Regional Controller to participate in statewide conferencing as well, but not instead of the level 3 incident controllers.
 - The Regional Controller must ensure that they are not duplicating any function being carried out in the IMT or the SOC. There should not, for example, be a regional planning unit and an IMT Planning Section: it should be one or the other. Overall the Regional Controller should have a small cell of people supporting them, not a large structure that sucks resources away from incident management activities.
- 4.4.20** The increased focus on IMTs that we are suggesting will require additional attention to be paid by incident controllers to the importance of local liaison, and communication pathways between the IMT and forward operations points. Recognising that it is not possible for an IMT based in a control centre to provide briefing and direction to front-line operational personnel, forward operations points are often set up at fire stations, staging areas and similar facilities to manage operations in the field. It is critical that IMTs are aware of what forward operations points are active, and to ensure that there is timely and relevant information flow to them in order to ensure that personnel are being briefed correctly and used effectively. It is also important for IMTs to ensure that forward operations points do not become 'mini IMTs' and that they understand their reporting line to the Operations section in the IMT.
- 4.4.21** One area of importance at the local level is that of the use of volunteers. Communities have among their volunteer ranks hugely diverse individuals with many and varied competencies, not to mention intimate knowledge of their local areas. One person (not themselves a volunteer) the Review spoke to said he thought the TFS should be viewed as a volunteer organisation, with paid support. Of course, any statewide organisation such as the TFS must have a network of paid people to provide for day-to-day matters, there may be additional opportunities for more volunteer engagement and involvement in operational leadership and specialisations such as remote area firefighting.
- 4.4.22** We discuss the specific issue of remote area firefighting below: our understanding was that in other areas, particularly the appointment of sector and divisional commanders in the incident management structure, and membership of incident management teams, there is more scope for volunteers to be involved. We were told, correctly or not, that in the Southern Region, TFS volunteers are not appointed to field management roles above the role of strike team leader. While it is important to maintain the principle that overhead managers are trained and experienced in the role, in states such as New South Wales and Victoria it is the norm for volunteers to hold management positions. We can see no reason why Tasmania should be any different.

- 4.4.23** We found that Group Officers (volunteers who manage a Group of volunteer brigades), though legislatively recognised as part of the TFS management structure, had been over time diminished in their command role and had their authority deferred to paid District Officers (we did however see examples of good practice in the way that Group Officers were used to manage resourcing for the ongoing commitment to these fires). Modern incident management practice requires that personnel in management roles such as Sector and Divisional Commander, or who take roles in incident management teams, need formal training in their function. There is, however, no reason that we can discern why this training should not be made available to volunteers so that they can supplement TFS capacity in IMT and field management roles and we think that TFS should identify and publicise pathways for volunteer officers to be qualified and used in this way.
- 4.4.24** The team would like to emphasise that without the phenomenal effort put in by volunteers during these fires, the State would not have been able to manage the work required, nor afford the bill at the end if they had been paid.
- 4.5 TOR 6: The effectiveness of the arrangements in place for requesting and managing interstate and international assistance and the significance of interstate and international assistance in managing the fires**
- 4.5.1** The use of interstate and overseas fire and land management agency personnel and resources provided much needed support during the fires, in keeping with similar practices in 2013 and 2016. Fires of this scale cannot be managed effectively by Tasmania alone. We received considerable positive feedback from local personnel concerning the expertise and enthusiasm of interstate and international fire fighters and managers. In particular, the New Zealand remote area firefighting contingent was highly regarded for their work ethic and professionalism.
- 4.5.2** The exchange of fire fighting, fire management and specialised expertise across jurisdictions provides for surge capacity and access to specialised skills not necessarily readily available locally. Given the largely common operating systems and platforms utilised across the nation (and in New Zealand and North America) and with the increasingly sophisticated and coordinated national resource sharing approach led by AFAC, this is becoming common place.
- 4.5.3** Large numbers of personnel came to Tasmania during the 2018-19 fire season to support a range of functions that are either not available within the State, or became exhausted. Additional resources would have been available from North America if they had been requested, with both the USA and Canada having appropriate management and front-line firefighting resources that they would have been happy to deploy if requested.
- 4.5.4** On considering the actual and potential resources available from Australia, New Zealand and further afield, the Review team concludes that there is no shortage of firefighting resources available to manage events of this nature. Much as it might take some days to mobilise resources from North America, resources from across Australia can usually be made available promptly on request and in numbers perfectly adequate to meet the needs of incident management teams. This comes at a cost to the receiving state, however, and we can understand that decisions to request interstate support always involve an element of cost-benefit analysis.
- 4.5.5** Supporting structures to manage resources similar to those established in 2016 were implemented this year. In 2016 this function was provided by personnel from New South Wales and Victoria: in 2019 it was led by TFS based on the arrangements set up formerly. AFAC played a key coordinating role through its National Resource Sharing Centre (NRSC) and the underpinning inter-jurisdictional agreements in place to which Tasmania is a party.
- 4.5.6** The establishment of an Interagency and International Liaison Unit (IILU) is a critical function, established at the state level – and in this case in the SOC – to undertake, as the name implies, coordination of resource requests and fulfilment from outside the jurisdiction. Personnel to support the IILU and the associated logistics functions at the regional and local level were provided by the fire agencies and also under a whole-of-government personnel arrangement known as the Interoperability program. AFAC provided NRSC liaison officers to the IILU during the fires.
- 4.5.7** Interstate and international resourcing will only run smoothly if a robust framework for raising resource requests within the affected State exists. The Review heard from various people that many resource requests from incident management teams were rejected or not actioned in a timely manner without adequate feedback. Opposing views were heard that some resource requests contained inadequate information to enable them to be actioned, while some incident management team members complained about little or no feedback to resource requests, evolving justification requirements and new processes being introduced during the events that people were unaware of.
- 4.5.8** We heard from some people who considered that delays to resource requests meant last minute decisions were being made despite otherwise good forward planning. Most significantly, resource requests (not knowing when and if they would be actioned) were identified as a risk to undertaking suppression activities.

- 4.5.9** The Review was told of instances of mismatched resourcing in terms of quantum and/or capability, requests being unnecessarily scrutinised, and misplaced. Though one would expect that sometimes – in the ‘fog of war’ – resourcing will not always work optimally, we conclude that there is room for improvement in Tasmania’s resourcing processes. We suggest that TFS (and to the extent necessary, PWS) should work towards a standardised resource management system that allows IMTs to raise resource requests in a standard form, and allows for notification of acceptance or refusal of those requests preferably on the day they are made or at least within 24 hours. Equally, the State Resources Unit should have available to it a process for requesting resources from the regions and receiving a prompt response.
- 4.5.10** Echoing what has already been said about the relative positions of the IMT and the Regional Controller, we think that resource planning – which goes hand in hand with incident action planning – is a function that sits most naturally within the IMT. We see no reason why a standardised resource request, supported by evidence of strategic incident action and resource planning, cannot be made directly to the State Resources Unit during major events. Regional Controllers have a responsibility to manage resources for business as usual and new starts in their region – and would also be responsible for responding to a request for resources to go elsewhere in the State, particularly if their own region was quiet.
- 4.5.11** The IILU becomes a critical function during major incidents and it is important that staff who are assigned to the IILU have had appropriate training in advance, including training in the use of interstate resource request processes and tracking of resources while they are in the State. This is not a role that it is appropriate to assign people in the hope that they can learn on the job – there is a significant body of national doctrine that has to be understood and applied to make the IILU function successfully. We pay tribute to those staff within TFS who were able to make the IILU a success drawing on the learnings of 2016.
- 4.5.12** We were told that a resource management software platform called IRMS (Incident Resource Management System) had been developed by Forestry Tasmania (now STT), and continued to be hosted and supported by them. IRMS did not, however, have buy-in from across all agencies and was not seen by people we spoke to as an answer to the resourcing issues encountered in the 2018-19 season. It was evident to us that spreadsheets of varying formats were being utilised for resource tracking, including adaptations and improvements being invoked on the run, often using the expertise of skilled ‘outsiders’. We consider that it is important that to the extent that software is required to support resource management, it should be common across agencies, and should be up to date: we note that STT has formed a working group to identify a suitable replacement for IRMS and we encourage TFS, PWS and STT to consider how this might fit into an all-of-state resource management system.
- 4.5.13** Along with appropriately skilled, structured and supported resource management cells and units, the policy surrounding their operation needs refinement. A sound set of arrangements that specify business rules, work flows and triggers for varying levels of resourcing, underscored by training and exercising will go a long way to ensure improving the overall incident management system, in particular when assistance from other jurisdictions is likely.
- 4.5.14** Strategic resource planning is an important function in any major event and is particularly important when considering the need to order resources from interstate or internationally, which comes at a substantial cost. It is hard to get right. There will always be a tension between incident management teams not wanting to over-order, which results in expensive resources lying idle, and needing to have sufficient resources to sustain a firefighting effort for what may be several weeks. The Review heard varying accounts of the effectiveness of strategic resource planning over the 2018-19 fire season. We suspect that there is little value in assessing specific issues with the benefit of hindsight, but we are able to draw the following broad conclusions:
- Strategic resource planning is a core function and must not be treated as an afterthought. Personnel need to be working within IMTs to plan not just for the forthcoming shift or two, but with a time horizon of 2-4 weeks out. If Planning staff within IMTs find it hard to find time for this, that is an indication that there is insufficient capacity within the Resources unit. It is possible to request expert support with strategic resource planning from elsewhere in Australia through national arrangements.
 - Resource planners should be sufficiently senior and experienced that they can make a confident assessment of the likely resource needs up to a month out and then be able to get the Incident Controller to approve these in a timely fashion.
 - Identification of future resource requirements by IMTs should be based on a robust options analysis which takes into account not only the technical options available, but the cost of employing different options and the reasons for the favoured option being chosen. As we discuss later in this report, this is not intended to displace the principle that decisions about resourcing should be based on operational need. Including an appreciation of the financial consequences of different options in a forward resourcing plan both highlights the opportunity costs of the chosen option and provides a level of assurance to senior management that resources are being ordered and used appropriately.

- It will always be a matter of judgement for regional and state-level structures as to how much oversight they need to apply to resource requests. If, however, oversight is deemed necessary, then processes must be put in place to allow approvals (or rejections) to be processed quickly. Where resources are being deployed on rotations of as few as five days (as is the case for volunteer firefighting resources) a delay of a day in approving a resource request can have serious knock-on effects for maintaining continuity of resourcing.
- Managers and approvers of strategic resource requests should be unapologetic about identifying proportionate strategic reserve requirements and requesting resources – within reason – that may not be tasked immediately. It is important when doing so, that the resources that are being sent are aware that they are a strategic reserve so that they have an understanding that it may not be possible to task them immediately on arrival.

- 4.5.15** In terms of outside assistance, it was not clear to us that specific cost analysis had supported decision-making about what resources to order from outside the State. For example, the review team did not see evidence that for arduous firefighting crews, the use of teams from NSW on five-day rotations were compared with longer rotations from Canada (at fixed daily cost) in terms of overall cost/benefit. That is not to say that incorrect choices were made, just that the evidence to support those choices is unclear. Similar comparisons across other roles and source capabilities would make for useful benchmarks so that more rigour could be applied to the matching of resources and need.
- 4.5.16** We consider that planning of this nature would be greatly facilitated if the actual costs of bringing in interstate and international resources were identified out of season, and trigger points were identified for requesting different types of resource. This would give added confidence to decision-makers in Tasmania that they were requesting outside assistance in the most appropriate and cost-effective manner, and would also support interstate and international partners to understand at what point they should consider readying resources in anticipation of a possible request.
- 4.5.17** In terms of on-ground deployment of resources the Review heard of instances where some teams (such as remote area firefighters) were redeployed to roles other than their primary purpose. It was explained to us that on days when tasking was not available to these resources (for example, where current or forecast weather conditions did not allow insertion to remote areas by helicopter) they were used in other roles such as tanker-based firefighting rather than being left untasked. Though this may be less than perfect, we understand and reinforce the need to be agile in these circumstances provided the rationale for re-direction is explained and the new work is purposeful.
- 4.5.18** A commendable feature of the Tasmania public sector is the Interoperability Program managed by the Department of Premier and Cabinet (DPAC). This program provides for a whole-of-government approach to personnel support to emergency management. Public servants are supported by their home agency to be assigned suitable support roles during emergency operations such as logistics or administration. The home agency continues to pay the base salary, while the beneficiary agency (in this case TFS) meets extraordinary costs such as overtime and accommodation.
- 4.5.19** The inquiry saw evidence of this working very well to fill needs of a general nature across incident management teams, regional and state centres. We did however hear of times when the skills of the support person were not ideally matched to the need. It is evident that key positions within the ILLU and logistics function benefit from those with the training and experience in the roles needed. This is particularly important for the ILLU manager – this is a critical role that requires specific competence in fire and emergency management/resource allocation.
- 4.5.20** The Review heard from many committed individuals from the State level. It was apparent – in keeping with the interoperability program mentioned earlier – that the emergency management sector, possibly led by the TFS and SES, needs to identify, encourage and support capable individuals to fill the many roles that will be required during a ‘campaign’ emergency event. Training needs to be provided to these individuals, at least in the Australasian Inter-service Incident Management System, to enable them to operate effectively in the emergency context. There are many senior roles in the SOC and supporting structures that could be filled by an appropriately managed ‘extended’ interoperability program.

4.6 TOR 7: The use and effectiveness of aviation firefighting resources, in particular, the suitability of aircraft types for the protection of environmental values, forest assets and the rural/urban interface in Tasmania

- 4.6.1** The Review has received a substantial amount of feedback about the use of aircraft in fighting the fires in Tasmania in the 2018-19 fire season (often referred to as ‘aerial firefighting’). A number of submissions made to us highlighted the tactical benefits of different aircraft types currently available on the market. There has also been significant comment in local and national media about the current and future use of aviation resources. This led the Review team to inquire into this subject in some detail.
- 4.6.2** We recognise that a detailed cost-benefit analysis of individual aircraft or tactics would require extensive discussion of specific operations and their effectiveness, which is not the intent of this Review. Accordingly, we present some discussion of and conclusions around issues related to aerial firefighting, while recognising that there is a deeper level of analysis that could be performed to support budget and operational decision-making in this field.

- 4.6.3** We start that discussion by reflecting that aerial firefighting has the potential to be very expensive. We are not sure whether all who have commented on the use of aerial resources in Tasmania in the 2018-19 season understand how much has been spent. We are advised that a sum in excess of \$40,000,000 was spent on aircraft in Tasmania over the season – which may be compared with the total expenditure of the Tasmania State Fire Commission for the financial year being just under \$96,000,000 in 2017-18⁶. This reflects an extensive use of aircraft, and of course a substantial opportunity cost.
- 4.6.4** Against that background, aviation resources enable a whole suite of activities that would otherwise be difficult or impossible. Aircraft have been used extensively in the 2018-19 fire season to identify new fire starts after lightning storms; to mount rapid first attack on fires using water and gel; to lay retardant lines intended to slow the advance of a fire to allow for it to be controlled from the ground; to acquire intelligence about fire spread and hot spots; and to insert and extract remote area fire crews to undertake that ground attack.
- 4.6.5** Tasmania participates in national arrangements coordinated by the National Aerial Firefighting Centre for the contracting and sharing of aircraft. Before the fire season, states (including Tasmania) contract a given number of aircraft to be available for the season, and also enter into arrangements for a ‘reserve’ fleet of ‘call when needed’ aircraft to be available for surge capacity. The seasonal contracts are expensive to maintain and must be paid for whether or not there is a significant level of fire activity, and represent a core fleet of resources. The call when needed contracts do not cost money if they are not used; but are much more expensive per hour than the seasonal contracts if they do have to be used.
- 4.6.6** The national arrangements mean that it may be possible for one state to ‘borrow’ an aircraft from another, if the other state is not using it. This happened in the 2018-19 season in Tasmania, notably in relation to the use of Large Air Tankers from Victoria and New South Wales, and aerial intelligence gathering aircraft.
- 4.6.7** Many different types of aircraft were used in Tasmania over the 2018-19 season. Helicopters were used both for water bombing and crew insertion; and a range of helicopter types were used including the Erikson Airplane Type 1 helicopters. Fixed wing aircraft were used for reconnaissance, water bombing, and laying of retardant line, and the fleet included scooping ‘Fire Boss’ aircraft (that can fill their tanks by skimming from an open body of water) and Large Air Tankers with a 15,000L capacity. Each of these different types of aircraft may be viewed as a tool in a toolkit, and discussion of how aircraft are used in a given context should be accompanied by an understanding of the cost of that, and what the alternatives are. We return to this theme below.
- 4.6.8** The Review received a number of public submissions discussing the use of aerial firefighting in Tasmania both this year and in previous years. Some of these submissions referred to the use of specific aircraft types; others to the use of aviation firefighting more generally. We also spoke to the National Aerial Firefighting Centre in the course of the Review, and met with individuals responsible for the allocation and deployment of aerial resources in Tasmania during the 2018-19 fire season. We can say with a high degree of confidence that aerial firefighting is a very well-understood tactic in Tasmania and in Australia more broadly, and that State and National bodies have a comprehensive knowledge of the resources available worldwide and decades of experience in Australian conditions of what works best.
- 4.6.9** We think that it will assist the reader to a better understanding of our conclusions, and of the broader considerations in deploying aircraft, if we identify some of the key points to be taken into account. Each of these points is, in our view, generally accepted by expert professional opinion in the industry and could be demonstrated by referring to detailed evidence if required. We have not sought, in the context of this report, to collect and lay out that evidence as this would be a disproportionately lengthy exercise; but we think that anyone wishing to do so could readily assemble a body of evidence to support the following statements.
- Aerial resources will not necessarily put the fire out. Water bombing can be a very effective first attack strategy, but for fires burning in organic soils or under tree canopies – as will often be the case after a lightning strike – intervention by ground crews will be required to extinguish the fire.
 - Equally, there is no guarantee that even intensive water bombing will suppress a fire burning in unfavourable weather conditions.
 - There are some meteorological conditions under which aircraft will be unable to fly. Examples are in low cloud and poor visibility – which conditions may exist in the period after a dry lightning event – and in high wind conditions – which may occur on the days of highest fire danger.
 - The time of day will also be relevant – although night flying trials have taken place with helicopters in Victoria, night operations carry additional risks and are not a universally accepted tactic across the global aerial firefighting community. We note the potential for fires to be started by lightning towards the end of daylight or even overnight, which may have grown to a significant size by the time air attack becomes practical.

6 State Fire Commission Annual Report 2017-18, p46

- A larger aircraft will not necessarily give a better result when undertaking fire attack. The Large and Very Large Air Tankers that are available in Australia are typically used for dropping water, gel or retardant in a line to deal with an extended fire edge or to provide a control line for ground crews to work off. But for precision application of water or gel to a particular part of a fire, a helicopter may be a better choice.
- There will be a limit to the number of aircraft you can have working on a fire due to air traffic control issues, and using aircraft such as the Large Air Tanker may prevent smaller aircraft from using the same airspace at the same time.

4.6.10 For all these reasons, policymakers need to be careful about assuming that aircraft are the answer to all fire suppression needs, or that if only we could have enough aircraft we could extinguish all fires while they are still small. Decisions about the acquisition and use of aircraft need to be made following careful analysis of what they will cost, what effect they are expected to have, and what else could be done with the money. And while it is true that up to a point, more aircraft will mean more fire suppression capacity, there is no amount of aircraft that can prevent large landscape fires from happening.

4.6.11 Against the background of those general points, we make the following observations about the use of aircraft during the 2018-19 fires.

4.6.12 A large number of aviation resources were deployed to these fires, as will be apparent from the amount of money spent. We think that Tasmanian fire agencies were well aware of the usefulness of aircraft and were not afraid to spend significant sums on a range of aircraft from small helicopters to Large Air Tankers. Different aircraft were appropriately used in different contexts.

4.6.13 Given the scale of operations both this fire season and in 2016, we concluded that Tasmanian fire agencies would be best served by a year-round air desk staffed by appropriately qualified and experienced personnel. The individuals who managed the aviation function for Tasmanian fire agencies are to be commended for their contribution: we were led to understand though that the person with lead responsibility for this area had only been in place for eight weeks before the fires started and was not experienced in the role.

4.6.14 There are a number of opportunities for cost saving in areas such as negotiating contracts when things are quiet, not at the point when aircraft or facilities such as landing and reloading at airports are urgently required. The person who manages the aviation function for Tasmanian fire agencies is (as happened in 2019) potentially responsible for oversight of a \$40 million operation, and in our view should have the training and experience commensurate with that level of responsibility. In our view the establishment of a Tasmanian State Air Desk for fire and emergency management, staffed year-round with specialist staff, should be a priority for Tasmanian fire agencies.

4.6.15 We wish to clarify that in recommending a State Air Desk, we are not saying that it has to operate in the same way that similar concepts operate in other states. This is about having a year-round dedicated resource with the job of managing Tasmania's aerial firefighting needs. Questions about how this works in practice, how aircraft are ordered in the event of a fire, and so on, are for the Tasmanian fire agencies to agree between themselves.

Recommendation 6

TFS, PWS and STT should establish a State Air Desk, to be staffed by specialist staff year-round, with responsibility for managing both preparatory and contractual issues out of season as well as aircraft management when fires or other emergency events are occurring.

4.6.16 Having a permanent State Air Desk would also potentially address some operational issues that we were made aware of. On one occasion, aircraft that came to Tasmania from the mainland were not fitted with radios compatible with those being used by ground resources. Communication had to take place indirectly through the Air Attack Supervisor. A State Air Desk could anticipate problems like this and come up with workable solutions. A Tasmanian State Air Desk could also be responsible for identifying other areas – such as the retardant mixing facilities suggested below – in which relatively modest investment might enhance Tasmania's capability to sustain aerial firefighting operations.

4.6.17 Another broader point that was made to us was that there were occasionally unclear lines of control when it came to aircraft allocation and use. It is a feature of the Australasian Inter-service Incident Management System (AIIMS) that incident management teams can have an Air Operations Manager, who is responsible for advising on the tactical use of aircraft. The IMT in turn will seek aviation resources from the State level; but once those resources are allocated to the IMT it is for the IMT to determine how to use them. A Tasmanian State Air Desk could develop and promote consistent doctrine on the ordering and use of aircraft, and could be accountable as the single point of contact for allocating aviation resources to IMTs in response to requests.

- 4.6.18** Aviation specialist roles such as Air Operations Manager were identified in the AFAC report into the 2016 Tasmanian fires as a capability gap; and we were pleased to hear that the recommendations of that report had been acted on in terms of evolving a cohort of trained and experienced specialists in aerial firefighting within Tasmania. We were made aware of the significant assistance given by trained aviation specialists from interstate in 2018-19 and we would encourage Tasmanian fire agencies, particularly TFS, to explore budgetary options to further strengthen their air operations capability through training personnel and where possible, seconding them to interstate agencies to gain experience in the management of air operations.
- 4.6.19** A number of people raised with us the acquisition and use of scooping aircraft that can self-fill from open bodies of water, such as are often seen in television footage working in Europe and Canada. In Tasmania in 2018-19, there were two single engine Fire Boss aircraft working, that have the same ability to self-fill from open bodies of water. These aircraft received a lot of positive feedback from people who worked with them and we understand that they will be contracted again in the future. Other models of aircraft may have greater carrying capacity than the Fire Boss but are significantly more expensive to acquire and maintain. No doubt the use of specific aircraft types will be kept under review by Tasmanian fire agencies, but we are satisfied that the use of scooping aircraft has been considered and appropriately implemented for the present.
- 4.6.20** The use of Large Air Tankers increased significantly in 2018-19 compared with 2016. Incident Management Teams had the knowledge and the confidence to order these resources, and conditions on the Australian mainland made it possible to release them for use in Tasmania. It is a potential capability gap that there is no Large Air Tanker based in Tasmania, but the significant expense of contracting one to be in the State for the entire season is likely to be hard to justify. Conversely, there is no Type 1 large water bombing helicopter such as the Erikson Aircrane contracted to Tasmania, and these machines had to be brought over from the mainland. While again there is a significant cost-benefit analysis to be done, we could see the value in Tasmanian fire agencies looking closely at the value of contracting such a machine for the Tasmanian season to enhance first strike capability.
- 4.6.21** Anecdotally we heard mixed reviews of the use of Large Air Tankers. While they are a powerful tool when it comes to laying long lengths of retardant or gel line, it was clear from practical observations made by personnel on the ground that there were situations in which they were less effective – for example where fires are burning in organic soils, a water drop from a LAT might be of limited use as it does not penetrate the ground far enough. Another problem is that LAT drops require significant backup from ground resources, in most cases. There have been observed incidences of fire burning through a line dropped by a LAT in less than an hour where there were no firefighters on the ground to take advantage of the short-term benefits of the drop.
- 4.6.22** The decision-making processes in terms of LAT use are made more challenging because of the significant cost (tens of thousands of dollars) for each drop, and the question of what else could have been done with the same amount of money. We believe from speaking with people in the Tasmanian fire agencies that they are keenly aware of this issue and want to take it into account in future decision-making. We think that they would be assisted to do so if an ‘at-a-glance’ type checklist could be produced for LAT use based on operational experience – this could be as simple as a one side of A4 listing circumstances in which LAT drops worked well, and circumstances in which the results were deemed unfavourable. This would not be intended to replace the use of judgement by individual incident managers, but could provide a useful point of reference.
- 4.6.23** Another important issue in aerial firefighting is cost control. We say more later in this report about financial management as an indispensable part of incident management, and this issue is highly relevant to aviation where the costs of a single LAT drop, or a day’s flying on a fire, may be significant. As part of the staffing of the State Air Desk recommended above, we think that a finance officer would add substantial value both to the necessary out of season negotiation and contracting activities, and to operational decision-making when it comes to the use of aircraft at fires. This goes beyond being an accountancy function, in our view: having a clear understanding of the financial implications of an operational decision can support options analysis and improve decision-making.

Recommendation 6A

The proposed Tasmania State Air Desk should have a finance officer attached to its staff.

- 4.6.24** An operational issue that the Review noted was the lack of retardant mixing facilities in the State of Tasmania. As matters stand, Large Air Tankers have to fly back to Victoria in order to take on loads of retardant (this is not the case for gel, foam or plain water, which can be loaded at Hobart or Launceston). The investment to set up these facilities in Tasmania would be relatively limited, less than \$100,000. We consider that there is a strong case for making this investment following analysis of where the best location would be for siting these facilities.

- 4.6.25** The Review was asked to consider the availability of a winching capability within the Tasmanian aerial fleet. There is one winch-capable aircraft in Tasmania year-round, which is used for search and rescue purposes: as a result it is not available for firefighting. We heard the view expressed that Tasmania needs a capability to winch remote area firefighters into inaccessible terrain so that they can carry out firefighting operations, and also that an additional winch-capable aircraft is required to carry out search and rescue operations specifically for injured firefighters, where they are working in terrain that cannot be reached by road.
- 4.6.26** We heard from a number of people who were anxious to stress the safety implications of winching firefighters into inaccessible terrain. This is likely to be the quickest way of getting ground-based firefighters to very remote fire starts; but there are safety implications around inserting firefighters into terrain that they may need to be winched out of as well. Although the risks associated with winching are acceptable when proper training and procedures are in place, it is not a risk-free activity.
- 4.6.27** In the AFAC report on the 2016 Tasmanian fires a recommendation was made for Tasmania to establish a winch capability for remote area firefighters. Consideration of this proposal by PWS led to the conclusion that this was not supported on a risk-benefit analysis: for the 2018-19 fires, winch capable firefighters were brought in from New South Wales. We have considered the issue afresh and we conclude that we should not make a further recommendation one way or the other, because establishing a winch capability involves a risk assessment and cost-benefit analysis that we think is best deferred to the Tasmanian fire agencies to undertake.
- 4.6.28** We agree with the view expressed in the 2016 report that a winch-capable firefighting force would be a useful tool to be available to Tasmanian fire agencies. The creation of such a force must be understood as being a program-level ongoing commitment requiring investment to train and skills maintain suitable personnel. The acquisition of appropriate numbers of winch-capable aircraft is also a potential financial burden that Tasmanian fire agencies will have to consider in its calculations. While overall we understand how such a capability could fit into Tasmanian firefighting efforts, we think that judgements of this nature, based as they are on finance and risk, are best made by the agencies in question.
- 4.6.29** The question of additional winch-capable search and rescue capability is a separate one, and we can see the force of the argument that only having one winch-capable aircraft in Tasmania for search and rescue operations when there are dozens of firefighters working in locations inaccessible by road requires careful risk analysis. We think that Tasmanian fire agencies should have a standing medical evacuation plan for all personnel working in remote areas and this plan should include commentary on how patients are to be extracted from inaccessible locations in the event of a serious injury or medical event, particularly if the year-round search and rescue aircraft was unavailable or on another call.

Recommendation 7

TFS, PWS and STT should jointly reach a decision on whether a winch capable remote area firefighting capability should be maintained in Tasmania; which agency or agencies should be responsible for that program; and how a winch capable remote area firefighting capability can be safely trained and kept current, to include consideration of the availability of winching aircraft. If the decision is taken not to maintain this capability in the state, TFS, PWS and STT should identify how the gap in capability that this represents should be filled in future fire seasons.

- 4.6.30** Our overall conclusion on the use of aviation firefighting in the 2018-19 season is that both locally and nationally, there is a high level of expertise available to select and deploy appropriate aircraft for firefighting in Tasmania. Where choices have been made about the deployment of particular aircraft types, we consider that these have been made based on a sensible cost benefit analysis and we do not think that there is any particular aircraft or aircraft type that has been overlooked or is not known about.
- 4.6.31** It is true to say that more money could be spent on aerial firefighting than was spent in 2018-19 – although the significant bill that was incurred should not be underestimated. We can see the logic in individual suggestions such as the permanent basing of a Type 1 (Airplane or similar) helicopter in Tasmania so that its superior water-carrying capability would be immediately available in the case of fires breaking out, instead of having to come from the mainland. Other suggestions that were made to us were potentially much more costly and included proposals for the acquisition of substantial fleets of expensive aircraft.

- 4.6.32** We do not think that it is our function as a Review to recommend specific levels of spending or contracting of aircraft. The underlying principle is in our view clear, that there is always scope to spend more money on different types of aircraft and as 'tools in the toolkit' they can generally be used to support fire suppression activities. But equally, the acquisition of yet more and more aircraft is likely to offer diminishing returns, can never be guaranteed to prevent the start or spread of large landscape fires, and what is more would inevitably lead to years of low fire activity in which tens of millions of dollars' worth of equipment was lying idle.
- 4.6.33** We suggest that future decisions about acquisition and deployment of aircraft should be clearly justified with reference to the principles discussed above. We encourage Tasmanian fire agencies to identify aircraft that they consider could be used to good effect and in a cost-effective way, and to ensure that there is an ongoing discussion with government about the availability of budgets to acquire and maintain an adequate aircraft fleet. Specific decisions about these are, however, beyond the scope of this Review.

4.7 TOR 8: Any other matter that the Review team identifies in the course of its activities as warranting discussion

Safety

- 4.7.1** Safety, both of firefighters and members of the community, is a key consideration for emergency management agencies. Of course the protection and preservation of life is the principal objective of hazard management activities, but those activities themselves need to be safe. The Review team accordingly considered the safety record of Tasmanian fire agencies over the 2018-19 bushfire season.
- 4.7.2** The following safety incidents were reported in relation to personnel combatting the 2018-19 bushfires:

Contractors	9
Interstate/Overseas Support Agencies	17
PWS	52
SES	1
STT	16
Tas Helicopters	1
TFS	56
Unknown	4
TOTAL	156

This total represents 114 accidents, injuries or illnesses; 24 hazards and 18 near misses. Of the injuries or illnesses reported by TFS, 12 have resulted in workers compensation claims, and a further ten workers compensation claims have been made by PWS personnel. While any safety incident is a matter of concern and agencies should always aim for zero safety incidents in the course of their operations, the Review team considers that the above statistics are commendable given the numbers of personnel fighting the fires and the challenging conditions in which many of them had to work.

- 4.7.3** The Review noted that a strategic safety advisor was appointed to work from the SOC in Hobart to coordinate safety management activities. We heard also of some difficulties in ensuring that safety officers were working in all IMTs that managed events across the season, including challenges arising from the limited numbers of locally qualified personnel. TFS, PWS and STT should ensure that they prioritise the appointment of safety advisors at any event where an IMT has been established, whether at level 2 or level 3 and regardless of the control agency. A training needs analysis may help to establish whether additional personnel should receive the training required to operate as safety advisor in an IMT.
- 4.7.4** One area in which we think that Tasmanian fire agencies need to review their current practices is in fatigue management. Fatigue is recognised as a safety issue for emergency management personnel. It is an issue not just for personnel on the fireline, who are at greater risk of physical accident or injury if they are fatigued. It is an issue for incident, regional and state control personnel as well, because fatigue can not only compromise effective decision-making – and hence the safety of others – but it risks the physical and mental health of the individuals who become fatigued. We do not think that it is acceptable to implement controls over the length of time and number of consecutive shifts that front line personnel can work but allow senior staff, up to and including the level of Chief Officer, to work long hours for weeks on end without a break.

Recommendation 8

TFS, PWS and STT should jointly carry out work to identify acceptable shift lengths and patterns – including requirements for rest days – for all personnel working on emergency operations. Once these have been identified, systems should be put in place to ensure that HR rostering practices follow these fatigue management guidelines. And senior staff should lead by example and ensure that they, as well as the people working under them, take adequate rest breaks.

Leave management

- 4.7.5** A number of people we spoke to questioned leave arrangements in place in Tasmanian fire agencies, and why individuals had leave planned for peak months of the fire season. We recognise that issues arise such as carer responsibilities around the school holiday period, and it would be inappropriate to be dogmatic about when people can and cannot take leave. We do however consider that there should be a presumption that leave is not scheduled for the months of January and February unless there is a particular reason, such as carer responsibilities, for this to be approved. We observed many occasions on which personnel selflessly returned to work despite having leave approved, and commend their commitment.
- 4.7.6** We also heard feedback about the number of staff available between Christmas and the New Year. While many office-based organisations see this period as suitable for a ‘close-down’ or skeleton staff, we think that this is not an appropriate expectation for a fire management agency and we suggest that managers across the Tasmanian fire agencies should plan to ensure the availability of a full complement of staff at this time of year. Of course, if weather conditions are moderate and there is no fire activity, on the spot decisions can be taken about permitting leave in the light of known weather conditions.

Finance

- 4.7.7** The 2018-19 fire season in Tasmania has been very expensive in terms of the sums spent on fire suppression activities. While final figures are not yet available, they are likely to be similar to the sum in the region of \$60,000,000 that was spent in 2016-17. This is nearly two thirds of the entire budget for the State Fire Commission for the year. While these sums are not met out of that budget – they are paid either by a special appropriation from State funds, or through support from the Australian government – they represent a significant financial item in the State’s budget.
- 4.7.8** The Review team was keen to understand how this was approached by the Tasmanian fire agencies in terms of financial management, procurement rules, and so on. We often asked the question of people we interviewed ‘if you had been asked at any given time during the fires to say what you had spent, would you have been able to?’ With one exception, the answer was ‘no’.
- 4.7.9** We should say that this is not an issue unique to Tasmania. We suspect that a similar response would be obtained from agencies in other jurisdictions that managed major emergency events this year. There has often been an attitude that in an emergency, agencies spend what they need to spend, and the accounting can be done afterwards. We do not, however, think that this is a sustainable approach for the sector in Australia into the future.
- 4.7.10** Emergency management agencies spend public money, and they are accountable for doing so no less in an emergency than they are at other times. If money needs to be spent of course it should be spent. But we cannot see how it is sustainable for money to be spent with no one keeping track of how much, and on what, in anything like real time.
- 4.7.11** Proper financial management is not only valuable to understand the level of budgetary commitment at a given time; it also supports incident control decision making. Choosing between two possible suppression options may be supported by an understanding of their respective cost which in turn reveals what other possibilities are being foregone by choosing an option. Money spent on valueless options is money that can’t be spent on other more effective activities.
- 4.7.12** Both in relation to aerial firefighting and the use of interstate and international resources, we found little evidence that decisions were being taken on the basis of robust financial and budgetary advice. That is not to say that decision-makers were not concerned about budgets, and we heard that resource requests from IMTs to State Resourcing were required to be supported with justification for them, indicating that there was no intent to provide a blank cheque for firefighting. The point is that the justification was not supported by numbers, and we could not identify that options analysis (for example, use Tasmanian resources on overtime, use interstate resources, or use international resources) was being supported by credible cost figures.

- 4.7.13** In our view, Tasmania is well-placed to take a lead on this important issue in Australia. The Interoperability Register may be able to support personnel skilled in financial control to be seconded to Tasmanian fire agencies during periods of increased activity, to provide advice to decision-makers on real time budgets, and the financial implications of choices. We emphasise – as comment of this nature can often be misunderstood – that the role of finance officers is not to prevent necessary decisions from being taken, or to interfere with operational decision-making. We think that it can only enhance the management of incidents and emergencies if the people tasked with making decisions are supported with information about what they are spending and what different options might cost.

Traffic management points

- 4.7.14** A number of people who made public submissions to the Review raised the issue of traffic management points and road closures. For public safety reasons, it is standard practice across Australasia and beyond to limit public access to areas in which a bushfire is burning, has burned, or is threatened. The challenge arises in relation to people who live within the boundaries of the restricted area and, while they are not subject to compulsory evacuation, may nonetheless be denied re-entry to the area if they leave.
- 4.7.15** This is not a simple issue to manage, because authorities responsible for setting up and then managing access restrictions would rightly be severely criticised if members of the public were injured or killed because they had been allowed into an unsafe area. We also recognise that because it is Tasmania Police that controls access, their actions in doing so are outside the scope of this Review. The consistent feedback we have received on this issue does, however, lead us to conclude that the Tasmanian fire agencies should seek discussions with Tasmania Police in order to ensure that there is clarity around what areas are too dangerous for anyone to be in; what areas need to have restricted access but it may be appropriate for residents to be allowed in and out, and what areas do not need to be restricted. The fire agencies then need to be prepared to commit resource to a regular – we suggest, daily – review of the boundaries of these areas and to notify police accordingly so that restrictions can be minimised.
- 4.7.16** We note that this issue has been a frequent theme in post-incident reviews elsewhere in Australia, and other jurisdictions have developed traffic management protocols as a result (Victoria is just one example). We would suggest that Tasmanian fire agencies could usefully do an analysis of what already exists in this space and consider its applicability to Tasmania.

Private firefighting resources

- 4.7.17** We received feedback in the course of public submissions to the Review about the utilisation, or lack of it, of private firefighting units in suppression activities. This term may refer to an individual trailer pump or slip-on unit owned by a farmer, to more extensive trained and equipped resources owned, for example, by a private forestry company.
- 4.7.18** No permission, of course, is required for someone to fight a fire on their own land with whatever means are available to them (the question of lighting fuel reduction or backburns on private land is a different one and is already regulated by law). It was suggested to us however that private units could be used more widely, and restrictions on vehicular movements in fire-affected areas should not apply to private firefighting resources.
- 4.7.19** We recognise that private firefighting units may be a very important resource in rural areas, and this is recognised in other jurisdictions by the formation of primary producer brigades, industry brigades, or by the issuing of public guidance such as the Victorian Country Fire Authority's *Guidelines for Operating Private Equipment at Fires*⁷. We note that TFS does not have similar published guidance and we think that some could usefully be developed.

Facilities

- 4.7.20** An issue that was raised with us on a number of occasions was the availability of facilities for State, Regional and incident management teams. We visited the IMT at Cambridge while it was in operation, and had the opportunity to see for ourselves how the physical facilities were arranged there; we also visited the State Operations Centre in Hobart and the Northern Regional Operations Centre at Youngtown.
- 4.7.21** Good operational facilities underpin good emergency management. One key point is that co-locating teams in one place can greatly ease information flow: being able to speak to a person or team who is located in the same place as you is much easier than having to try to track them down by phone or email, particularly at busy times.

7 https://www.cfa.vic.gov.au/documents/20143/71835/2016_Private_Equipment_Guidelines_edn2_jun16.pdf

- 4.7.22** A practical example of this is the presence of a TWWHA natural and cultural values planning cell in the PWS building in Macquarie Street, remote from the TFS State planners at TFS headquarters in Argyle Street. We were struck by how this arrangement went beyond hampering efficient communication between the teams: it actually led to suspicion of what the PWS team was seeking to achieve, which in our view was unjustified. We do not think that this would have been anything like the issue it became, if those teams had been co-located.
- 4.7.23** More broadly, our assessment of the Cambridge facility – and the feedback we received from the people who were working there – was that it was awkwardly laid out, cramped, and not supportive of contemporary incident management practice. Purpose-built facilities these days will often have a large central area where teams can be accommodated in an open plan environment, supporting open communication between different incident management functions, while also having breakout rooms situated around (and often visible from) the central area where specific conversations can take place off the central ‘floor’. This was far from being the case at Cambridge, and is not really found at TFS Hobart headquarters either.
- 4.7.24** As a Review team we are reluctant to recommend specific items of expenditure because we recognise that these are matters for agencies to plan and accommodate within existing budgets. Our view is, however, that there is really no State Control facility for emergencies in Tasmania that can support operations on the scale seen in the 2018-19 fire season. We have already discussed in this report how it is important for State and Regional control functions to be separate from incident management teams, and how those separate components of the emergency management structure need to be careful that they do not unwittingly overlap. That does not, however, mean that thought could not be given to co-locating the State Control Centre, the Southern Regional Control Centre, and the Southern joint agency IMT in one purpose-built location. However this is done, we are of the view that TFS should engage in planning for new, purpose-built control facilities and should seek budgetary support from government for a preferred option.

Recommendation 9

TFS should engage in discussions with government about the construction of purpose-built State Control Centre facilities for emergency management in Tasmania.

ICT and data

- 4.7.25** We heard some criticism of ICT facilities in Tasmanian fire agencies, including lack of interoperability between TFS and PWS (in particular) and access issues for interstate personnel who came to Tasmania to assist. In raising this issue with the responsible people, we were advised that the issues were acknowledged, but many of them stemmed from a lack of planning in advance and advice provided as to what might be needed.
- 4.7.26** We do not have the expertise to make professional judgements about ICT facilities, but it does seem to us that some joint planning with State government ICT experts away from the peak season, together with some exercising of emergency arrangements to enhance an understanding of what upgrades may be required, could provide benefits and we suggest that TFS considers undertaking this activity.

Follow-up and tracking of recommendations

- 4.7.27** The Review is acutely aware of the number of reports that have been produced in recent years on emergency management activities in Tasmania. These have produced a multiplicity of recommendations; some more than others. It is a challenge for agencies to take on board and track the number of recommendations received, and this is not an issue unique to Tasmania but can be observed elsewhere in the country as well.
- 4.7.28** In some states, responsibility for the tracking of recommendations and their implementation has been given to an appointed Monitor, or to a responsible officer such as an Inspector-General of Emergency Management. The benefit of doing this is not just to see if a recommendation has been implemented: there can also be value in revisiting recommendations that become obsolete or appear to be less desirable in the light of experience or new information. An independent tracking body can effectively declare that a recommendation has been completed, or should no longer be pursued.
- 4.7.29** We encourage TFS, PWS and STT to discuss with government how a function of this nature could be pursued; the appointment of a specified individual is not a requirement and, for example, the SEMC might be willing to take on this function.

5 PUBLIC CONSULTATION

- 5.1** One of the objectives of the Review was to provide a forum for public submissions, so that all points of view had an opportunity to be heard.
- 5.2** We were very grateful to all of those who took the time and effort to provide submissions to the Review and we were struck by the care and thoughtfulness that so many members of the Tasmanian community put into providing submissions and feedback.
- 5.3** We carefully read and considered all of the submissions that we received. The numbers of submissions and the many different points they covered means that we are unable to acknowledge them individually in our report. We have done our best, though, to ensure that all of the topics on which we received submissions have been discussed.
- 5.4** The submissions received are set out below and will be made publicly available, unless the author has requested confidentiality.

No.	Date	Name	Organisation
1	7 April	Austen Hawkins	University of Tasmania
2	9 April	Mark Geary	Member of the Public
3	10 April	Daniel	Member of the Public
4	11 April	Harold Reilly	Member of the Public
5	15 April	Keith Darke	Derby Mountain Bike
6	16 April	Brian Hodgson	Member of the Public
7	16 April	James Downey	Member of the Public
8	16 April	David Hean	Brigade Chief, Brady's Lake Brigade
9	23 April	Simon Hattrell	Member of Public
10	24 April	Nicholas Sawyer	Tasmanian National Parks Association
11	24 April	Malcom Wells	National Parks and Wildlife Advisory Council
12	25 April	Juanita Brokas	Member of the Public
13	26 April	Natalie Eiser	Member of the Public
14	26 April	Chari Jolly	Member of the Public
15	26 April	Professor Bowman	University of Tasmania
16	27 April	Dr Geoff Holloway	United Tasmania Group
17	27 April	Bob Hawkins	Member of the Public
18	28 April	Luca Vanzino	Member of the Public
19	28 April	Gerald Crawford	Retired District Officer, Tasmania Fire Service
20	28 April	Peter Ockerby	State Safety Advisor, Tasmania Fire Service
21	29 April	Robin Costain	Member of the Public
22	29 April	Rob Blakers	Member of the Public
23	29 April	Anthony Archer	Member of the Public
24	29 April	Judy Moore	Tasmanian Visitor Information Network
25	29 April	Ron Mann	Member of the Public
26	29 April	Dean Brampton	Member of the Public
27	29 April	Robyn Lewis	Central Highlands Wildlife Group
28	30 April	Cheryl and Greg Oates	Members of the Public
29	30 April	Robyn Berrington	Member of the Public
30	30 April	Andrew Darby	Member of the Public
31	1 May	Mike O'Brien	Member of the Public
32	1 May	Brett Burgess	Retired Volunteer
33	1 May	Todd Dudley	North East Bioregional Network
34	2 May	Karen Spinks	Member of the Public
35	2 May	Bert Lawatsch	Member of the Public

No.	Date	Name	Organisation
36	2 May	Greg Pullen	Member of the Public
37	2 May	Gerry and Sue White	Members of the Public
38	2 May	Gerald Ellis	Member of the Public
39	2 May	Robert Frost	Member of the Public
40	2 May	David Haynes	Member of the Public
41	2 May	Roger Underwood	The Bushfire Front Inc
42	2 May	Wayne Tucker	TasNetworks
43	2 May	Martin Gill	Meander Valley Council
44	2 May	Adam Wilson	Central Highlands Council
45	2 May	Stephen Rymer	PF Olsen
46	2 May	Liz Smith	Member of the Public
47	2 May	Pat Synge	Huon Valley Rate Payer Association
48	2 May	Danza Hardwicke	Tasmanian Mountain Cattleman's Association
49	2 May	Barbara Dawson	Member of the Public
50	2 May	Randall Trethowie	Member of the Public
51	2 May	Chris Peterson	Member of the Public
52	3 May	Tony Cannon	Institute of Foresters of Australia
53	3 May	Martin Moroni	Private Forests Tasmania
54	3 May	Robert Flanagan	Australian Workers Union
55	3 May	Sheralee Davies	Wine Tasmania
56	3 May	Geoff Law	Wilderness Society
57	3 May	Therese Taylor	Convenor Tasmania Forest and Forest Products Network
58	3 May	Dean Sheehan	Sustainable Timber Tasmania
59	3 May	Simon Roberts	Member of the Public
60	3 May	Amy Robertson	Member of the Public
61	3 May	George Harris	Huon Resource Development Group
62	5 May	David Downie	Member of the Public
63	5 May	Kelly Wilton	Support Tassie's Timber Industry
64	6 May	David Bradford	Derwent Valley Council
65	6 May	Rebecca Bell	Huon Valley Council
66	6 May	Geoffrey Swan	Member of the Public
67	7 May	Jenny Cambers-Smith	Member of the Public
68	7 May	Adam Wilson	Central Highlands Council
69	8 May	John Gunn	Member of the Public
70	8 May	Ian Sauer	State Fire Management Council
71	8 May	Peter Downie	Member of the Public
72	8 May	Leigh Hills	United Firefighters Union Australia (Tasmania Branch)
73	10 May	Peter Skillern	Tasmanian Farmers and Graziers Association
74	10 May	Laurie Dillon	Member of the Public
75	13 May	Jeff Leddin	Member of the Public
76	13 May	Chris Topham	Hydro Tasmania
77	13 May	Andrew Denman	Tasmanian Special Timbers Alliance
78	13 May	Nicholas d'Antoine	Member of the Public
79	14 May	Jo Donnelly	Member of the Public
80	15 May	Jan Lineham	Member of the Public

6 CONCLUSIONS

- 6.1 We wish to finish this report by paying tribute to the many people who went the extra mile to deliver a safe, effective response to the Tasmanian bushfires of 2018-19.
- 6.2 The Review team considers it a credit to the Tasmanian fire agencies and their staff that this Review does not need to deal with issues of injuries or fatalities to the public who use Tasmania's extensive wilderness areas for recreation: that there were no fatalities among firefighters responding in arduous and remote locations and that injuries did not occur in significant numbers.
- 6.3 In the 2016 report on that year's bushfires in Tasmania, the Review team said that the fires had been unprecedented. The same cannot be said this year – 2016 provided the precedent for the events of 2018-19. It is a credit to the Tasmanian fire agencies that many of the lessons of 2016 appear to have been learned and put into practice in 2019.
- 6.4 We think, though, that it is clear that the current legal and policy basis for firefighting in Tasmania is outdated, and it was our sense that those arrangements started to show their age in the 2018-19 season. Current progress towards statutory reform in Tasmania provides an opportunity for the State to align the legislative underpinnings of fire management in Tasmania with contemporary best practice, and to continue on the journey that the Tasmanian fire agencies started years ago with the formation of the MAC Group.
- 6.5 Our two main takeaways from the 2018-19 fires would be these. First, that there is great value in having a single point of coordination and control for unwanted fires burning in the State – but the significant proviso is that with control comes accountability; and the agency that has control must also be accountable for the full range of values, human and natural, that are at risk from fires in Tasmania.
- 6.6 Secondly, firefighting – whether ground-based or aviation – on this scale is more expensive than ever before, and represents a significant item of expenditure not only in agency but in State budgets. That may be unavoidable. But there needs to be financial accountability for this activity, both in Tasmania and, we would argue, elsewhere in Australia. Firefighting as a profession is enormously respected in our country, and if that respect is to be maintained, we need to be open in demonstrating that our use of public resources is truly for the public good.

7 GLOSSARY

AFAC	Australasian Fire and Emergency Service Authorities Council
AIIMS	Australasian Inter-Service Incident Management System
BOM	Bureau of Meteorology
BRAM	Bushfire Risk Assessment Model
IAP	Incident Action Plan
IC	Incident Controller
IMT	Incident Management Team
LAT	Large Air Tanker
MAC	Multi-agency Co-ordination (Group)
NAFC	National Aerial Firefighting Centre
PWS	Parks and Wildlife Service
ROC	Regional Operations Centre
SEMC	State Emergency Management Council
SES	Tasmania State Emergency Service
SOC	State Operations Centre
STT	Sustainable Timber Tasmania
TFS	Tasmania Fire Service
TWWHA	Tasmanian Wilderness World Heritage Area

ANNEXE A: THE TASMANIAN FIRE AGENCIES

THE COMMISSION, CHIEF OFFICER AND TASMANIAN FIRE SERVICE

- A1.1** The Tasmanian Fire Service and Fire Commission are established under ss 6 and 7 respectively of the *Fire Services Act 1979*. The Commission consists of the Chief Officer and Fire Service employee representatives. The Commission is responsible for the formulation of Fire Service policy, the co-ordination and development of all fire services throughout the State, the development of effective fire prevention and protection measures and the development and promulgation of the State Fire Protection Plan.
- A1.2** The Chief Officer is established under s.10 of the Act as the Chief Executive of the Tasmanian Fire Service (TFS) and is responsible for the control and management of the fire-fighting resources of the Fire Service. TFS is responsible for all structural fire suppression in Tasmania and for fire suppression on all private lands, unallocated Crown Land and in Wellington Park. Where bushfires occur under conditions and in situations where there is an imminent risk to, or actual impact upon structures and communities, the TFS shall direct the response to those fires where practical. The TFS has responsibility for the issuing of all declarations and warnings.
- A1.3** Tasmania has three statutory geographical regions within the State – North, South and North West. Within these regions there are 233 TFS brigades. The Chief Officer TFS is responsible for 311 TFS full-time equivalent operational career employees and 178 non-operational career employees, 4047 operational volunteers and 1022 non-operational volunteers. The Chief Officer TFS is also responsible for the Director SES, who manages 24 SES employees and 629 volunteers.

PARKS AND WILDLIFE SERVICE

- A1.4** The Parks and Wildlife Service (PWS) is a unit within the Department of Primary Industries, Parks, Water and Environment and has responsibility for the management of approximately 3.3 million hectares of parks and reserves across Tasmania including the Tasmanian Wilderness World Heritage Area.
- A1.5** Section 30(3)(ca) of the *National Parks and Reserves Management Act 2002* gives authority to the PWS to: 'to take any steps or undertake any activities that the managing authority considers necessary or expedient for the purposes of preventing, managing or controlling fire in reserved land, having regard to the management objectives for that reserved land'. As an occupier of land, the PWS also is obliged under s.64 of the Fire Service Act s.64 to take diligent steps to extinguish the fire or to prevent it from spreading and to report the fire.
- A1.6** The framework for PWS fire management is as follows:
- PWS State Fire Management Policy is a high-level document covering adopted principles, standards and approaches to fire management;
 - PWS State Fire Planning Policy provides the overall framework for fire management planning in PWS;
 - PWS Code of Practice for Fire Management establishes principles, standards and guidelines that will apply to fire management on reserved land;
 - PWS Park and Reserve Management Plans (for example TWWHA Management Plan) contain a section dealing with fire management policies and actions that relate specifically to that park or reserve;
 - PWS Regional Strategic Fire Management Plans have been prepared for PWS regions being Northwest, Northern and Southern. These plans are structured in accordance with PPRR.
 - Annual Planned Burning Program and Fire Works Plans - These are prepared annually and identify and gain approval for all the planned burning and works programs that may be undertaken for the coming year;
 - Annual Fire Action Plan is prepared and updated on an annual basis and covers PWS arrangements across the State. The purposes of the Fire Action Plan are to identify the actions required by the PWS, on a routine daily and weekly basis, for the prevention and readiness to control bushfires and their impacts; to be a reference document for fire duty officers and regional staff.

SUSTAINABLE TIMBER TASMANIA

- A1.7** Sustainable Timber Tasmania (STT) is a Tasmanian Government business enterprise responsible for sustainably managing approximately 800,000 hectares of public production forest (Permanent Timber Production Zone land). STT manages its land consistent with its obligations under the *Forest Management Act 2013*, the *Government Business Enterprise Act 1995*, the *Forest Practices Act 1985* and the *Forestry (Rebuilding the Forest Industry) Act 2014*.
- A1.8** In accordance with the Government Business Enterprises Act, a Ministerial Charter describes the operational scope and Government's broad expectations of STT. The Charter identifies fire management as one of STT's core activities and requires STT to *inter alia* act in accordance with the Inter-Agency Fire Management Protocol. Core activities and Non-commercial activities under fire management are included in Schedules 1 and 2 respectively and include fuel management, establishment and maintenance of fire breaks and the prevention, preparation for and suppression of wildfires; research and the preparation of regional fire management plans.
- A1.9** As an occupier of land, STT is also obliged under s.64 of the Fire Service Act to take such diligent steps as necessary during the fire permit period to extinguish or prevent any fires burning on that land from spreading and to report the fire. STT's approach to fire management is outlined in the Forest Management Plan and includes a PPRR approach in accordance with the following aims:
- Minimise the occurrence and impacts of bushfires;
 - Minimise the severity of bushfires through strategic fuel reduction burning;
 - Maximise Sustainable Timber Tasmania's readiness to respond to bushfires;
 - Minimise the severity of bushfires through coordinated, effective and efficient responses; and
 - Promote forest recovery after fires.
- A1.10** STT has a Strategic Fire Management Plan (statewide) under which sit Regional Fire Action Plans and Tactical Fire Management Plans. Operational Burn Plans are also prepared for every prescribed burning operation.

ANNEXE B: THE REVIEW TEAM

GUY THOMAS

Guy Thomas has worked with the Queensland Parks and Wildlife Service for over 35 years in a variety of operational and senior management roles.

With formal qualifications and training in Science, Business and Project Management, Guy has been involved in all aspects of protected area management across a diversity of landscapes. This includes several roles in fire management, ecotourism, asset and visitor management and involvement with World Heritage Areas.

Guy's senior management experience includes five years as Director of the QPWS Technical Services group with oversight of the agency's fire & pest programs, asset management, ecological research, spatial and ICT systems, cultural heritage and park management planning.

Currently the Director of Asset Services, Guy has responsibility for asset capital works and maintenance programs, infrastructure design, fleet management and radio communications. He represents QPWS on the Australasian Fire Authorities Council and is a member of the AFAC Collaborative Procurement and Business Strategy working group.

MAL CRONSTEDT

Mr Mal Cronstedt AFSM commenced his career in the fire service as a volunteer in 1976, joining full-time in 1982. He has served across ranks and roles in the State's fire and emergency services in a variety of operational and support functions. In 2003 Mr Cronstedt undertook a year-long secondment to Fire & Rescue NSW (then NSW Fire Brigades) and in 2005 joined the NSW Rural Fire Service as the Blue Mountains Superintendent. He returned to Western Australia in 2008 as Fire and Emergency Service Authority's Rural Operations Coordinator South and was subsequently appointed as Chief Superintendent Country South in July 2012, upon the creation of the Department of Fire and Emergency Services (DFES).

Mr Cronstedt was appointed inaugural Director of the Office of Bushfire Risk Management in August 2012. In August 2014 he became Executive Director of the State Emergency Management Committee (SEMC) Secretariat (subsequently Office of Emergency Management). In March 2018, he was appointed DFES' Deputy Commissioner Strategy and Emergency Management. Mr Cronstedt is an ex-officio member of the SEMC and a member of the Australia-New Zealand Emergency Management Committee. Mr Cronstedt has significant operational and public policy experience across Australia, including, for example, contributing to the development of the latest version of the Australian Interagency Inter-service Management System and a national risk reduction strategy.

Mr Cronstedt holds a Master of Business Administration, a Graduate Diploma in Disaster Management and a Bachelor of Arts. He is a Graduate of the Australian Institute of Company Directors, the Institution of Fire Engineers and the Australia and New Zealand School of Government's Executive Fellows Program.

Mr Cronstedt was awarded the Australian Fire Service Medal in 2013.

PAUL CONSIDINE

Paul Considine is qualified as a barrister in the UK. He has held positions in Australian state and Commonwealth public services, including as a Director of Investigations in the office of the Commonwealth Ombudsman.

Paul joined the Australasian Fire and Emergency Service Authorities Council in 2010 as Manager, Operations (Urban Fire and State Emergency Services). In 2013 he took up a two-year ministerial appointment as an Assistant Inspector of the Scottish Fire and Rescue Service, with HM Fire Service Inspectorate in Scotland: in that capacity he was lead inspector on various inquiries and reports into the SFRS.

Paul returned to AFAC in 2016 to work on setting up the National Resource Sharing Centre, an Australasian initiative for sharing fire and emergency management resources. He was subsequently appointed General Manager of the Emergency Management Professionalisation Scheme, which promotes emergency management as a profession and sets professional practice standards for a range of emergency management roles. Paul is currently Director, Capability and Assurance at AFAC with responsibilities across the fields of national capability, resource sharing, and reviews and inquiries.

ANNEXE C: ORGANISATIONS THAT CONTRIBUTED TO THE REVIEW

Tasmania Fire Service

Parks and Wildlife Service Tasmania

Sustainable Timber Tasmania

Tasmania Police

Tasmania State Emergency Service

Department of Premier and Cabinet, Tasmania

Tasmania Volunteer Fire Brigades Association

Tasmania Retained Volunteer Firefighters' Association

United Firefighters' Union (Tasmania)

The Wilderness Society Tasmania

National Parks Society

Rural Fire Service New South Wales

Australasian Fire and Emergency Service Authorities Council

Huon Valley Council

We thank all the organisations and individuals that made the time to assist us with our work.

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Annual Report 2017-18, Tasmania State Fire Commission 2018

Guidelines for Operating Private Equipment at Fires, Country Fire Authority Victoria 2016

A review of the management of the Tasmanian fires of January 2016, AFAC 2016

Tasmanian Wilderness World Heritage Area Bushfire and Climate Change Research Project, Press 2016

Interagency Fire Management Protocol, Tasmanian fire agencies 2018

Next page: The forest canopy can be too dense for aircraft to effectively water bomb hotspots. Instead they are tasked with filling up portable collar dams which supply water to hundreds of meters of firefighting hose laid throughout the forest floor. All equipment is either carried or flown in. (Credit: Warren Frey and TFS)



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